

**DRAFT
ECONOMIC ANALYSIS
OF PROPOSED CRITICAL HABITAT DESIGNATION
FOR THE QUINO CHECKERSPOT BUTTERFLY**

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PREFACE

On May 11, 2001, the U.S. Court of Appeals in the Tenth Circuit issued a ruling that expressly found fault with how the Service conducted its economic analysis on the critical habitat designation for the southwestern willow flycatcher.¹ Specifically, the court rejected the method used by the Service to define and characterize baseline conditions.² In that analysis, the Service defined baseline conditions to include the effects associated with the listing of the flycatcher and, as is typical of many regulatory analyses, proceeded to present only the incremental effects of the rule.

On May 11, 2001, the U.S. Court of Appeals in the Tenth Circuit issued a ruling that addressed the analytical approach used by the Service to estimate the economic impacts associated with the critical habitat designation for the southwestern willow flycatcher.³ Specifically, the court rejected the approach used by the Service to define and characterize baseline conditions.⁴ Defining the baseline is a critical step within an economic analysis, as the baseline in turn identifies the type and magnitude of incremental impacts that are attributed to the policy or change under scrutiny. In the flycatcher analysis, the Service defined baseline conditions to include the effects associated with the listing of the flycatcher and, as is typical of many regulatory analyses, proceeded to present only the incremental effects of the rule.

The court's decision, in part, reflects the uniqueness of many of the more recent critical habitat rulemakings. Specifically, the flycatcher was initially listed by the Service as an endangered species in 1995, several years prior to designating critical habitat. Once a species has been officially listed as endangered under the Act, it is afforded special protection under Federal law. In particular, it is illegal for any one to "take" a protected species once it is listed. Take is defined to mean harass,

¹ New Mexico Cattle Growers Association, et.al. v. U.S. Fish and Wildlife Service, No. 00-2050, U.S. Court of Appeals, Tenth Circuit, May 11, 2001.

² In a previous case, Middle Rio Grande Conservancy District v. Bruce Babbitt, No. CIV 99-870, 99-872, and 99-1445M/RLP (consolidated), U.S. District Court for the District of New Mexico, the court similarly questioned the approach used by the Service to identify the economic effects of designating critical habitat for the Rio Grande silvery minnow. Although the court openly questioned the definition used by the Service to establish the baseline of the economic analysis, the court did not expressly rule on this approach as it set aside the rule for other reasons.

³ New Mexico Cattle Growers Association, et.al. v. U.S. Fish and Wildlife Service, No. 00-2050, U.S. Court of Appeals, Tenth Circuit, May 11, 2001.

⁴ In a previous case, Middle Rio Grande Conservancy District v. Bruce Babbitt, No. CIV 99-870, 99-872, and 99-1445M/RLP (consolidated), U.S. District Court for the District of New Mexico, the court similarly questioned the approach used by the Service to identify the economic effects of designating critical habitat for the Rio Grande silvery minnow. Although the court openly questioned the definition used by the Service to establish the baseline of the economic analysis, the court did not expressly rule on this approach as it set aside the rule for other reasons.

harm pursue, hunt, shoot, wound, kill, trap, capture, collect, or to attempt to engage in any such conduct. Implementing regulations promulgated by the Service further define “harm” to mean “... an act which actually kills or injures wildlife. Such an act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering.”⁵

Because the southwestern willow flycatcher was initially listed as endangered by the Service in 1995, several years before the designation of critical habitat, the flycatcher, along with its habitat, already received considerable protection before the designation of critical habitat in 1997.⁶ As a result, the economic analysis concluded that the resulting impacts of the designation would be insignificant.⁷ This conclusion was based on the facts that: (1) the designation of critical habitat only requires the Federal government to consider whether their actions could adversely modify critical habitat; and (2) the Federal government already was required to ensure that its actions did not jeopardize the flycatcher.

For a Federal action to adversely modify critical habitat the action would have to adversely affect the critical habitat’s constituent elements or their management in a manner likely to appreciably diminish or preclude the role of that habitat in both the survival and recovery of the species.⁸ However, the Service defines jeopardy, which was a pre-existing condition prior to the designation of critical habitat, as to “engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species.”⁹ The “survival and recovery” standard is used in the definition of both terms and as a result, the additional protection afforded the flycatcher due to the designation of critical habitat was determined to be negligible.

The court, however, considered why Congress would want an economic analysis performed by the Service when making a decision about designating critical habitat if in fact the designation of critical habitat adds no significant additional protection to a listed species. In the court’s mind, “(b)ecause (the) economic analysis done using the FWS’s baseline model is rendered essentially without meaning by 50 CFR 402.02, we conclude Congress intended that the FWS conduct a full analysis of all of the economic impacts of a critical habitat designation, regardless of whether those

⁵ 50 CFR 17.3. The Service’s definition of harm to include significant habitat modification was later confirmed by the U.S. Supreme Court (*Sweet Home Chapter of Communities for a Great Oregon v. Babbitt*, 1F3d 1 (D.C. Cir. 1993)).

⁶ See 60 FR 10694 and 62 FR 39129.

⁷ *Economic Analysis of Critical Habitat Designation for the Southwestern Willow Flycatcher*, Division of Economics, U.S. Fish and Wildlife Service, June 1997.

⁸ *Consultation Handbook*, U.S. Fish and Wildlife Service, March 1998, p. 4-39.

⁹ 50 CFR 402.02.

impacts are attributable co-extensively to other causes.”¹⁰

Even though the court’s ruling applies only to the designation of critical habitat for the southwestern willow flycatcher, this analysis attempts to comply with the court’s instructions by revising the approach to defining baseline conditions within the areas of proposed critical habitat. Specifically, this analysis presents a detailed discussion of existing Federal, State, and local requirements and both current and planned activities within proposed critical habitat that are reasonably expected to occur regardless of whether the area is designated as critical habitat. Only after considering how these activities most likely will be affected given existing conditions, does the analysis estimate how the designation of critical habitat could impact forecasted activities.

This approach to baseline definition employed in this analysis is similar to that employed in previous approaches, in that the goal is to understand the *incremental* effects of a designation. However, it does provide more extensive discussion of pre-existing baseline conditions than previous critical habitat economic analyses. Typical economic analyses concentrate mostly on identifying and measuring, to the extent feasible, economic effects most likely to occur because of the action being considered. Baseline conditions, while identified and discussed, are rarely characterized or measured in any detailed manner because by definition, these conditions remain unaffected by the outcome of the decision being contemplated. While the goal of this analysis remains the same as previous critical habitat economic analyses, that is to identify and measure the estimated incremental effects of the proposed rulemaking, the information provided in this analysis concerning baseline conditions is more detailed than that presented in previous studies.

¹⁰ 50 CFR 402.02 defines the terms used by the Service in implementing sections 7(a)-(d) [16 U.S.C. 1536(a)-(d)] of the Endangered Species Act of 1973, as amended. The regulatory definitions for the terms “jeopardy” and “adverse modification” can be found in this section.

EXECUTIVE SUMMARY

1. The purpose of this report is to identify and analyze the potential economic impacts that would result from the proposed critical habitat designation for the quino checkerspot butterfly (*Euphydryas editha quino*). This report was prepared by Industrial Economics, Incorporated, for the U.S. Fish and Wildlife Service's Division of Economics.
2. Section 4(b)(2) of the Endangered Species Act (Act) requires the Service to base critical habitat proposals upon the best scientific and commercial data available, after taking into consideration the economic impact, and any other relevant impact, of specifying any particular area as critical habitat. The Service may exclude areas from critical habitat designation when the benefits of exclusion outweigh the benefits of including the areas within critical habitat, provided the exclusion will not result in extinction of the species.

Proposed Critical Habitat

3. The Service has proposed critical habitat designation for the quino checkerspot on approximately 301,010 acres of land in Riverside and San Diego Counties, California. Approximately 60,490 acres, or roughly 20 percent of the total acreage proposed, are located on federally-owned or managed lands; 10,890 acres (3.6 percent) are owned by the Cahuilla Band of Mission Indians; 16,460 acres (5.5 percent) are state or local government lands; and the remaining 213,170 (70.8 percent) of the total acreage proposed is located on private lands.

Framework and Economic Impacts Considered

4. This analysis examines the future impacts of section 7 of the Act on specific land uses or activities within those areas proposed as critical habitat for the quino checkerspot. Impacts include future effects associated with the listing of the species, as well as any effect of the designation above and beyond those impacts associated with listing. The listing of the species is the most significant aspect of species protection, as it provides the majority of protections by making it illegal for any person to "take" a listed species. Take is defined by the Act to mean harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct.
5. To quantify the proportion of total economic impacts attributable to the critical habitat designation for the quino checkerspot, beyond economic impacts of listing, the analysis evaluates a "without critical habitat" scenario and compares it to a "with critical habitat" scenario. The "without critical habitat" baseline for analysis represents current and expected economic activity under all modifications prior to critical habitat designation, including protections already accorded the quino checkerspot under Federal and state laws, such as the California Environmental Quality Act. The difference between the two scenarios

measures the net change in economic activity attributable to the designation of critical habitat for the quino checkerspot.

6. To estimate the costs and benefits of section 7 implementation for the quino checkerspot on existing and planned activities and land uses occurring in the proposed critical habitat area, the following framework was applied:

1. Develop a comprehensive list of possible Federal nexuses on Federal, Tribal, state, county, municipal, and private lands in and around the proposed critical habitat area.
2. Review historical patterns and current information describing the section 7 consultations in the proposed critical habitat area to evaluate the likelihood that nexuses would result in consultations with the Service.
3. Determine whether specific projects and activities within the proposed critical habitat area involve a Federal nexus and would likely result in section 7 consultations.
4. Evaluate whether section 7 consultations with the Service would likely result in any modifications to projects, activities, or land uses.

Finally, the analysis determines the proportion of these effects associated with the proposed critical habitat designation as opposed to the listing.

7. Three primary categories of potential costs are considered in the analysis. These categories include:

- Costs associated with conducting section 7 consultations associated with the listing or with the proposed critical habitat in the proposed critical habitat area (e.g., administrative effort).
- Costs associated with any modifications to projects, activities, or land uses resulting from the outcome of section 7 consultation.
- Costs associated with uncertainty and public perceptions resulting from the designation of critical habitat. Uncertainty and public perceptions about the likely effects of critical habitat that may cause project delays and changes in property values, regardless of whether critical habitat actually generates incremental impacts.

Costs of the Designation

8. The majority of consultations resulting from the critical habitat designation for the quino checkerspot are likely to address land development, road construction or road expansion activities. This analysis estimates that over ten years, critical habitat designation will result in approximately 10 additional biological surveys, 21 to 40 additional formal consultations, and 3 reinitiations of consultations that occurred as a result of the listing of the quino checkerspot. In addition, it is expected that the Service will provide technical assistance on 180 inquiries regarding uncertainty about the presence or extent of critical habitat on their lands. In addition, many consultations are likely to result in Service recommendations for project modifications. Results of the economic analysis of the proposed designation of critical habitat for the quino checkerspot are summarized below in terms of landownership category:

- **Federal Agencies:** It is likely that the designation of critical habitat for the quino checkerspot will lead to several new, additional, or reinitiated consultations for activities on Federal lands. Formal consultations, as well as modifications to projects and land uses, may result from critical habitat designations. Federal agencies that may consult with the Service more often as a result of critical habitat designation include the Army Corps of Engineers, the Bureau of Land Management, the U.S. Department of Transportation, the Bureau of Indian Affairs, the Federal Communication Commission, the Environmental Protection Agency, and the U.S. Forest Service.
- **Tribal Governments:** The Cahuilla Band of Mission Indians is likely to be affected by critical habitat designation for quino checkerspot. The Cahuilla are likely to see an increase in both formal and informal consultations, mainly as a result a Federal nexus associated with Bureau of Indian Affairs oversight of Tribal activities.
- **State and Municipal Agencies:** California state and municipal agencies likely to be affected by critical habitat designation for the quino checkerspot include the Metropolitan Water District of Southern California, California Department of Transportation, California Department of Fish and Game, California Department of Forestry, California Department of Parks and Recreation, the counties of San Diego and Riverside, and the City of San Diego. Impacts on these agencies are estimated to primarily consist of time spent on technical assistance provided by the Service. However, the California Department of Transportation may see an increase in both formal and informal consultations, either as a result of state activities involving Federal funding or through the permitting of state activities by the U.S. Department of Transportation.
- **Private Landowners:** The activity most likely to result in new, reinitiated, or additional consultations as a result of the designation of critical habitat for

the quino checkerspot is development that takes place on private lands and involves Federal funding, permitting, or authorization. Other activities on private land, such as farming, grazing, and mining, should not be subject to any additional or extended consultations or project modifications beyond those attributable to the listing of the quino checkerspot. For all activities on private lands, if no Federal nexus exists, then the proposed critical habitat designation creates no additional economic impacts beyond those attributable to the listing of the quino checkerspot.

- **Additional Impacted Parties:** Some small construction companies and developers may be affected by modifications or delays to development projects that result from section 7 consultations attributable to the designation of critical habitat for the quino checkerspot. Some landowners may also experience temporary changes in property values as markets respond to the uncertainty associated with critical habitat designation.

Benefits of Critical Habitat

9. Potential benefits of the critical habitat designation include reduced uncertainty regarding the location and extent of essential quino checkerspot habitat and easier identification of areas suitable for re-establishment of the quino checkerspot. The designation of critical habitat may also result in some incremental benefits associated with coastal sage scrub habitat preservation, and an increase in property values due to incidental preservation of open spaces. However, it is difficult at this time to estimate the total benefit afforded by critical habitat, since little information is available regarding the following: (1) the likely benefits of each consultation and modification; and (2) the extent to which such consultations and modifications would result from critical habitat.

Summary

10. Exhibit ES-1 provides a summary of incremental consultation, survey, technical assistance costs, and project modification costs associated with critical habitat designation for the quino checkerspot over a ten-year period. These costs are described fully in Sections 3 and 4 of this report. A ten-year time horizon is used because many land owners and managers do not have specific plans for project beyond ten years. In addition, the predictions of future economic activity in this report are based on current socioeconomic trends and the current level of technology, which are likely to change in the long term.

Exhibit ES-1 ESTIMATED TOTAL COSTS ATTRIBUTABLE TO DESIGNATION OF CRITICAL HABITAT FOR THE QUINO CHECKERSPOT (2001 to 2010, 2001 dollars)		
Action	Range	Total Costs
Technical Assistance	<i>Low</i>	\$14,000
	<i>High</i>	\$45,000
Biological Surveys*	<i>Low</i>	\$49,000
	<i>High</i>	\$74,000
Formal Consultation	<i>Low</i>	\$196,000
	<i>High</i>	\$627,000
Reinitiation	<i>Low</i>	\$8,000
	<i>High</i>	\$24,000
Project modifications	<i>Low</i>	\$3,200,000
	<i>High</i>	\$13,300,000
Total	<i>Low</i>	\$3.5 million
	<i>High</i>	\$14.1 million
<p>*Surveys not otherwise included as part of formal consultations or project modifications. Note: Dollars are presented as nominal figures. Because of the uncertainty in projecting the year in which actions may occur, all actions are assumed to take place in 2001, thus identifying the largest possible cost. Third parties are defined as California state agencies, local municipalities, Tribes, and private parties. Figures have been rounded. Sources: IEC analysis based on data from the Federal Government General Schedule Rates, 1999, Office of Personnel Management, 2000, and information from Biologists in the U.S. Fish and Wildlife Service, Carlsbad Fish and Wildlife Office.</p>		

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11. In February 2001, the U.S. Fish and Wildlife Service (the Service) proposed the designation of critical habitat for the quino checkerspot butterfly (*Euphydryas editha quino*) on approximately 301,010 acres of land in San Diego and Riverside Counties, California. The purpose of this report is to identify and analyze potential economic impacts that could result from the proposed critical habitat designation. This report was prepared by Industrial Economics, Incorporated (IEc), under contract to the Service's Division of Economics.
 12. Section 4(b)(2) of the Endangered Species Act (the Act) requires the Service to base proposed designation of critical habitat upon the best scientific and commercial data available, after taking into consideration the economic impact, and any other relevant impact, of specifying any particular area as critical habitat. The Service may exclude areas from critical habitat designation when the benefits of exclusion outweigh the benefits of including the areas within critical habitat, provided that the exclusion will not result in extinction of the species.
 13. Under section 7(a)(2) of the Act, Federal agencies must consult with the Service in order to ensure that activities they fund, authorize, permit, or carry out are not likely to jeopardize the continued existence of the species. The Act defines "jeopardize" as taking any action that would appreciably reduce the likelihood of both the survival and recovery of the species. For designated critical habitat, section 7(a)(2) also requires Federal agencies to consult with the Service to ensure that activities they fund, authorize, or carry out do not result in destruction or adverse modification of critical habitat. Adverse modification of critical habitat is defined as any direct or indirect alteration that appreciably diminishes the value of critical habitat for the survival and recovery of the species.
 14. This analysis identifies potential section 7-related impacts that will occur in the critical habitat area over the next ten years and distinguishes between the economic impacts caused by the listing of the quino checkerspot butterfly and those effects caused by the proposed critical habitat designation. To evaluate the increment of economic impacts attributable to the critical habitat designation for the quino checkerspot butterfly (hereafter, "quino checkerspot"), beyond economic impacts of listing, the analysis evaluates a "without critical habitat" scenario and compares it to a "with critical habitat" scenario. The difference between the two is a measure of the net change in economic activity that may result solely from the

designation of critical habitat for the quino checkerspot. In the event that a land use or activity would be limited or prohibited by another existing statute, regulation, or policy, the economic impacts associated with those limitations or prohibitions are identified, but would not be attributable to critical habitat designation.

15. The critical habitat designation for the quino checkerspot encompasses land owned or managed by the Federal government, the State of California, San Diego County, Riverside County, the City of San Diego, Cahuilla Band of Mission Indians and private landowners. This analysis assesses how implementation of section 7 of the Act for the quino checkerspot may affect current and planned land uses and activities in the proposed critical habitat designation over the next ten years. For non-Federal lands, section 7 consultations and resulting modifications to land uses and activities can only be required when a Federal nexus, or connection, exists. A Federal nexus arises if the activity or land use of concern involves Federal permits, Federal funding, or another form of Federal involvement. Section 7 consultations are not required for activities on state, county, tribal, and private land that do not involve a Federal nexus.
16. To be considered in the economic analysis, activities must be "reasonably foreseeable," including, but not limited to, activities which are currently authorized, permitted, or funded, or for which proposed plans are currently available to the public. Current and future activities occurring in the proposed critical habitat area during the next ten years that could potentially result in section 7 consultations or modifications are considered.

1.1 Description of Species and Habitat¹¹

17. The quino checkerspot has a wingspan of about 4 centimeters (1.5 inches). The top sides of the wings have a red, black, and cream-colored checkered pattern and the bottom sides are dominated by a red and cream marbled pattern. The quino checkerspot was historically distributed throughout the coastal slope of Southern California, including Los Angeles, Orange, Riverside, San Diego, and San Bernardino Counties, and northern Baja California, Mexico.¹² The known range of the quino checkerspot in the United States is now reduced to small habitat patches in San Diego and Riverside Counties. Quino checkerspot populations may vary greatly from year to year.
18. The primary constituent elements (PCEs) of critical habitat for the quino checkerspot

¹¹ The information on the quino checkerspot butterfly and its habitat included in this section was obtained from the *Proposed Designation of Critical Habitat for the Quino checkerspot butterfly*, February 7, 2001 (66 FR 9475).

¹² Mattoni, R, 1997, "The endangered Quino checkerspot, *Euphydryas editha* Quino (Lepidoptera:Nymphalidae). *Journal of Research on the Lepidoptera* 34:99-118.

are defined as those habitat components that are essential for the primary biological needs of larval diapause, feeding and pupation, adult oviposition, nectaring, roosting and basking, dispersal, genetic exchange, and shelter. The areas proposed by the Service as critical habitat for the butterfly contain one or more of the PCEs for survival of the butterfly. PCEs include, but are not limited to, plant communities in their natural state or those that have been recently disturbed (e.g., by fire or grubbing) that provide populations of host plant and nectar sources for the quino checkerspot butterfly. Habitat patch suitability is determined primarily by larval host plant density, topographic diversity, nectar source availability, and climatic conditions.

1.2 Proposed Critical Habitat

19. The Service has proposed critical habitat designation for the quino checkerspot on approximately 301,010 acres of land in Riverside and San Diego Counties, California. Approximately 60,490 acres (20.1 percent) of the total acreage proposed, are located on federally-owned or managed lands; 10,890 acres (3.6 percent) are owned by the Cahuilla Band of Mission Indians; 16,460 acres (5.5 percent) are state or local government lands; and the remaining 213,170 (70.8 percent) of the total acreage proposed is located on private lands. The proposed critical habitat consists of four units, with the majority of proposed critical habitat (57.7 percent) located in Unit 2. Exhibit 1-1 summarizes ownership of lands proposed for critical habitat designation for the quino checkerspot.

Exhibit 1-1					
SUMMARY OF PROPOSED CRITICAL HABITAT UNITS FOR THE QUINO CHECKERSPOT BY MANAGER, HOLDER, OR OWNER Area Expressed in Acres					
Unit	Federal (Percent of total)	Tribal (Percent of total)	State/Local (Percent of total)	Private (Percent of total)	Total per Unit (Percent of total)
Unit 1	1,360	0	2,900	27,820	32,080 (10.7%)
Unit 2	25,650	10,890	4,210	132,810	173,560 (57.7%)
Unit 3	26,150	0	4,780	41,540	72,470 (24.1%)
Unit 4	7,330	0	4,570	11,000	22,900 (7.6%)
Total	60,490 (20.1%)	10,890 (3.6%)	16,460 (5.5%)	213,170 (70.8%)	301,010 (100%)
Source: <i>Proposed Determination of Critical Habitat for the Quino checkerspot butterfly</i> (66 FR 9475). Note: Percentages may not sum to 100 percent due to rounding.					

20. A more detailed description of each unit is provided below:

- **Unit 1: Lake Matthews-** Critical habitat in this unit encompasses Bureau of Land Management lands (BLM), California Fish and Game lands, Metropolitan Water District lands, Riverside County lands and private lands. This unit includes 12,120 acres which the Service considers to be within the current geographic range occupied by the quino checkerspot, and 19,960 acres that it considers to be within the historic range but outside the current geographic range (i.e., not known to be occupied).
- **Unit 2: Southwest Riverside Unit-** This critical habitat unit consists of a mixture of private land interspersed with parcels of BLM lands, U.S. Forest Service lands (San Bernardino National Forest and Cleveland National Forest), Riverside County lands, Metropolitan Water District lands, as well as a large parcel entrusted to the Cahuilla Band of Mission Indians. This unit includes 162,860 acres which the Service considers to be occupied by the quino checkerspot, and 10,700 acres that are not known to be occupied.
- **Unit 3: Otay Unit -** This critical habitat unit includes lands owned by the Service (San Diego National Wildlife Refuge), BLM, U.S. Navy, the Immigration and Naturalization Service (INS), California State Lands Commission, San Diego County, City of San Diego, and private owners. This unit includes 66,660 acres which the Service considers to be occupied by the quino checkerspot, and 5,810 acres that are not known to be occupied.
- **Unit 4: Jacumba Unit-** This unit includes lands owned by BLM, California Department of Parks and Recreation (Anza-Borrego State Park), California Department of Fish and Game, San Diego County, and private owners. This unit includes 13,860 acres which the Service considers to be occupied by the quino checkerspot, and 9,040 acres that are not known to be occupied.

1.3 Framework for Analysis

21. As noted above, this economic analysis identifies the impacts to specific land uses or activities within those areas proposed as critical habitat for the quino checkerspot. Impacts include future effects associated with the listing of the species, as well as any effect of the designation above and beyond those impacts associated with listing. The listing of the species is the most significant aspect of species protection, as it provides the majority of protections by making it illegal for any person to "take" a listed species. Take is defined by the Act to

mean harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct.

22. To quantify the increment of economic impacts attributable to the critical habitat designation for the quino checkerspot, beyond economic impacts of listing, the analysis evaluates a "without critical habitat" scenario and compares it to a "with critical habitat" scenario. The "without critical habitat" baseline for analysis represents current and expected economic activity under all modifications prior to critical habitat designation, including protections already accorded the quino checkerspot under Federal and state laws, such as the California Environmental Quality Act. The difference between the two scenarios measures the net change in economic activity attributable to the designation of critical habitat for the quino checkerspot.

1.4 Methodological Approach

23. This report relies on a sequential methodology and focuses on distilling the salient and relevant aspects of potential economic impacts of designation. The methodology consists of:
- Considering what specific activities take place on the state, tribal, local, and private land affected by critical habitat designation;
 - Identifying whether activities taking place on the state, tribal, local, and private land are likely to involve a Federal nexus;
 - Evaluating the likelihood that identified Federal nexuses will result in consultations and, in turn, that consultations will result in modifications to projects;
 - Attributing costs to any expected consultations and project modifications;
 - Assessing the extent to which small businesses would incur costs as a result of modifications or delays to projects;
 - Determining economic costs associated with public perceptions about the effect of the proposed critical habitat designation on the private land subject to designation; and
 - Determining the proportion of the costs identified through the above steps that would be attributable to the proposed critical habitat designation as opposed to the listing of the quino checkerspot.

1.5 Information Sources

24. The primary sources of information for this report were communications with personnel from the Service and affected state and local agencies, as well as publicly available data (e.g., databases available on the Internet). In addition, Geographic Information Systems (GIS) data were provided by the Service; University of California at Berkeley, Institute of Urban and Regional Development; California Department of Water Resources, Division of Planning and Local Assistance; U.S. Department of Commerce, Bureau of the Census; and San Diego Association of Governments.

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25. This section provides relevant information about regulatory elements that exist in the baseline, i.e., the "without critical habitat" scenario. In addition, relevant information about the socio-economic characteristics of regions that include critical habitat is provided.

2.1 Baseline Elements

26. The statutes, regulations, and other baseline elements that may affect proposed critical habitat areas for the quino checkerspot include regulations regarding the listing of the species under the Act, the *Quino Checkerspot Butterfly Draft Recovery Plan*, the recent Executive Order on Tribal Lands, as well as relevant California state and local statutes, regulations and memoranda. Exhibit 2-1 shows which baseline elements apply to various proposed quino checkerspot critical habitat units. Each element is described in more detail below.

2.1.1 Quino Checkerspot Survey Areas

27. On January 16, 1997, the Service listed the quino checkerspot as an endangered species, under the Act, as amended. Under the listing, Federal agencies must consult with the Service regarding any actions they fund, authorize, permit or carry out that may affect a listed species. The listing of the quino checkerspot is the most significant aspect of baseline protection, as it makes it illegal for any person to "take" the species without a permit from the Service.¹³ In order to prevent take of quino checkerspot butterflies, the Service has been recommending that landowners conduct biological surveys of their lands before commencing new land-altering activities since 1997. To aid landowners in locating the species on their properties, the Service has delineated areas where biological surveys for quino checkerspot are recommended (a map has been released since 1999). The survey protocol recommends that a landowner: 1) have a biologist do a habitat assessment to see whether quino checkerspot habitat is present; and 2) if habitat is present, conduct adult focused surveys for adult butterflies.

¹³ The Act defines "take" as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct."

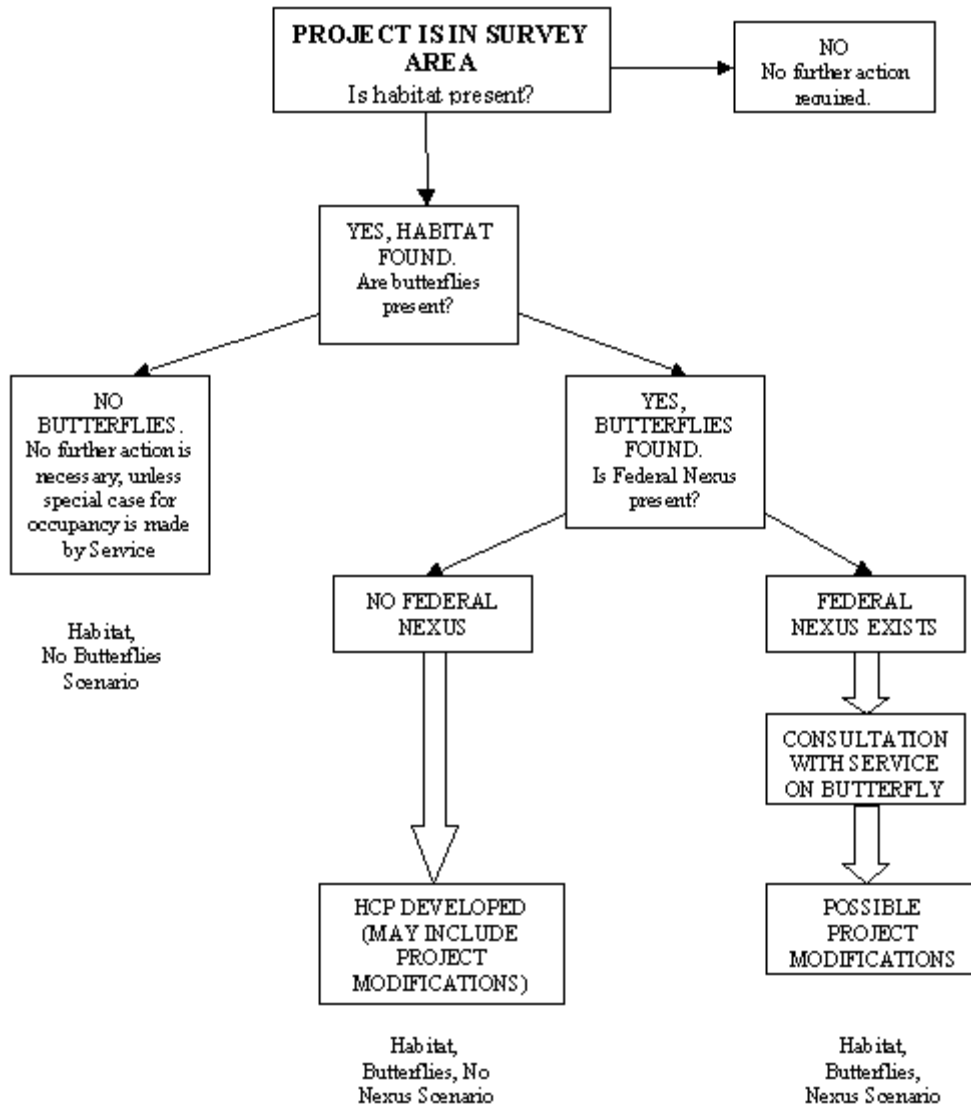
Exhibit 2-1				
RELEVANT BASELINE ELEMENTS				
Element	Affected Units			
	Unit 1	Unit 2	Unit 3	Unit 4
Year 2000 Quino Checkerspot Survey Areas	Partial	★	★	★
Recovery Plan	★	Partial	★	★
Overlap with Other Endangered Species	★	★	★	★
Executive Order for Tribal Lands	-	★	-	-
California Environmental Quality Act	★	★	★	★
California Natural Community Conservation Plan				
• Multiple Species Conservation Program (San Diego County subarea, 1998, City of San Diego subarea, 1997, Chula Vista subarea, 2001)	-	-	★	-
• Multiple Species Conservation Plan for North San Diego County (planned for 2003-4)	-	[Partial]	-	-
• Multiple Habitat Conservation and Open Space Program for Eastern San Diego County (planned for 2005)	-	-	-	[★]
• Western Riverside County Multiple Species Habitat Conservation Plan (in preparation)	[★]	[★]	-	-
• Lake Matthews Multiple Species Habitat Conservation Plan and Natural Community Conservation Plan (1995)	Partial	-	-	-
• Habitat Conservation Plan for the Stephens' Kangaroo Rat (1996)	Partial	Partial	-	-
★ = Regulation applies to entire unit. [] = Regulation is not presently in place.				

28. The release of the survey area map has led to several hundred surveys for the quino checkerspot being conducted over the past three years. The end result of the survey process varies, but may include the creation of a Habitat Conservation Plan (HCP) or the development of a formal consultation and associated project modifications. Exhibit 2-2 demonstrates the four most common results of the survey process as they have occurred prior to the designation of critical habitat. The "No Habitat" scenario occurs if a habitat assessment finds that no quino checkerspot habitat is present. In this case, the Service does not normally recommend additional precautionary actions on the part of the landowner. The "Habitat, No Butterflies" scenario occurs if a habitat assessment finds quino checkerspot habitat, but the adult butterfly survey finds no butterflies. In this case, the Service usually

does not recommend additional precautionary actions, except in cases where a butterfly has been recently sighted nearby. In that case, the landowner may develop an HCP or, if a Federal nexus exists, a consultation may be initiated. The "Habitat, Butterflies, No Nexus" scenario occurs when a habitat assessment finds quino checkerspot habitat and the adult-focused survey finds butterflies, and no Federal nexus exists. In this case, the landowner usually develops an HCP and an incidental take permit is issued by the Service. The "Habitat, Butterflies, Nexus" scenario occurs when a habitat assessment finds quino checkerspot habitat, the adult-focused survey finds butterflies, and a Federal nexus exists. In this case, the Federal Action agency enters into consultation with the Service about possible adverse effects on the butterfly. If a proposed project is likely to adversely affect butterflies, a formal consultation resulting in a biological opinion is written by the Service which may include recommendations to modify the project under consideration.

Exhibit 2-2. The "without critical habitat scenario."

This exhibit illustrates the four most common results of the survey process prior to the designation of critical habitat for the quino checkerspot.



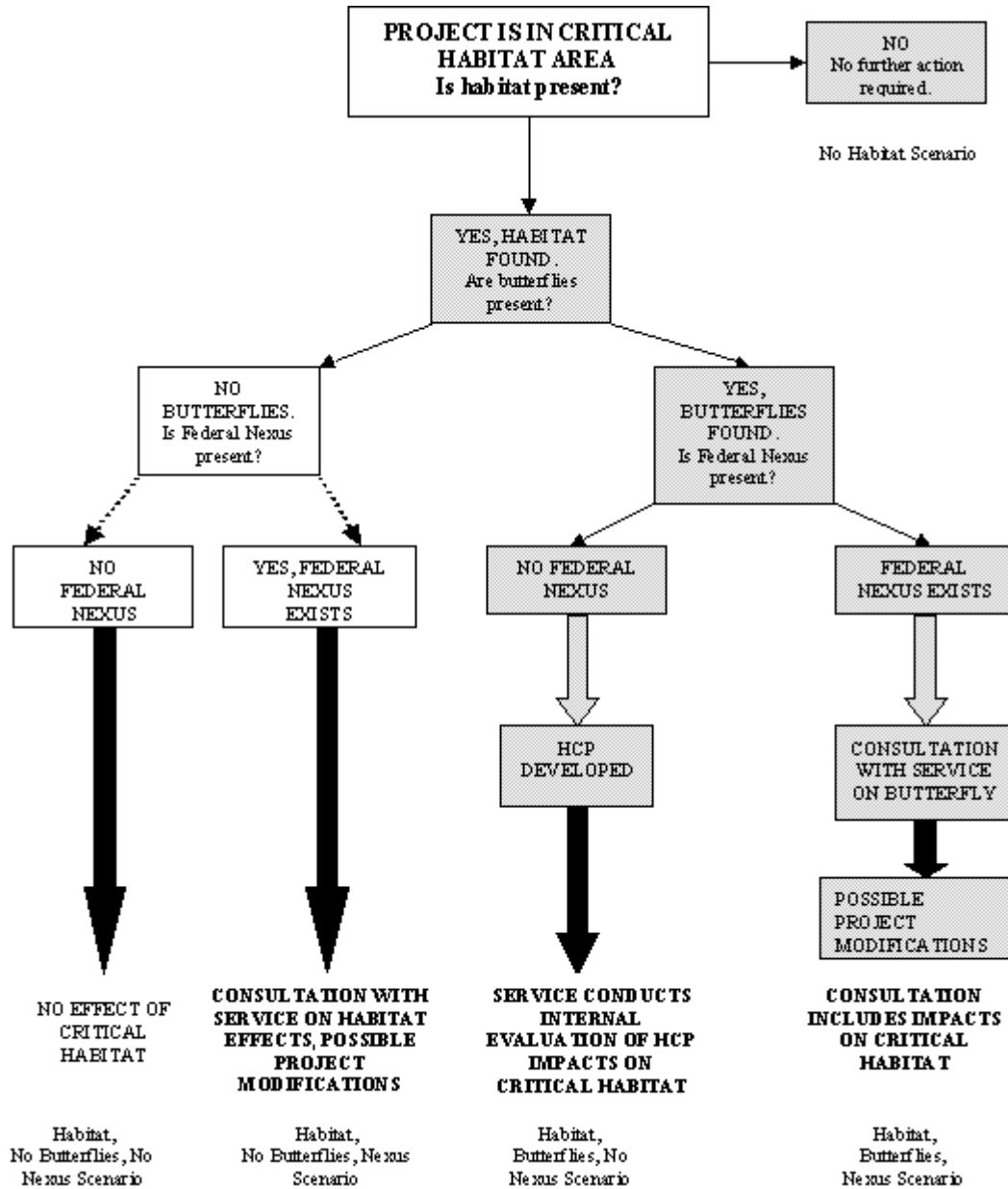
29. This analysis finds that the outcomes of the above processes may change in areas designated as critical habitat for the quino checkerspot. Exhibit 2-3 demonstrates the key changes that are likely to occur once critical habitat is designated. Gray areas show processes that are likely to remain unchanged in the "with critical habitat" scenario. The most significant change is likely to occur in the "Habitat, No Butterflies" scenario, when a habitat assessment finds habitat, but the adult-focused survey finds no butterflies. After critical habitat designation, the Service would consult with a Federal Action agency on activities that could affect habitat when a Federal nexus exists, regardless of the history of quino checkerspot sightings in the area. In contrast, without critical habitat designation in that area, the Service likely would not consult under these circumstances. These additional actions that may occur after critical habitat designation are highlighted in Exhibit 2-3. Thus, absent other limiting regulations, the requirement to consult in all critical habitat areas that contain quino checkerspot habitat would likely result in an increase in the number of consultations conducted on behalf of the quino checkerspot. The Service notes that many of these incremental consultations may be informal if they occur in areas without recent sightings of quino checkerspot.¹⁴
30. Designating critical habitat is also likely to add an increment of complexity to future consultations that result from the listing of the species under the Act, in that such consultations will be required to address impacts to critical habitat. However, due to the rarity of the quino checkerspot, most conservation decisions already incorporate habitat considerations. Thus, additional administrative effort and project modifications associated with critical habitat considerations should be minimal on the part of the Service and other entities involved in consultations that would have occurred under the listing.¹⁵ Incomplete projects may also have to reinstate consultation with the Service in instances where formal consultations have already been completed (Habitat, Butterflies Scenario), but where no consideration was specifically made for effects to proposed critical habitat.

¹⁴ Personal communication with Biologist, U.S. Fish and Wildlife Service, Carlsbad Fish and Wildlife Office, January 23, 2001.

¹⁵ Personal communication with Biologist, U.S. Fish and Wildlife Service, Carlsbad Fish and Wildlife Office, January 23, 2001.

Exhibit 2-3.

The "with critical habitat scenario." This exhibit illustrates the changes to the results of the surveys process that may result from the designation of critical habitat for the quino checkerspot. Gray areas are unchanged from the "without critical habitat" scenario. Note that the only areas affected are within the boundaries of the critical habitat designation.



2.1.2 Recovery Plan

31. Another important component of the baseline scenario is the *Draft Recovery Plan for the Quino Checkerspot Butterfly* (Recovery Plan), published in February 2001.¹⁶ The draft Recovery Plan includes a map delineating proposed recovery units for the quino checkerspot, as well as the methodology employed in determining its distribution. Nearly all of the proposed critical habitat areas for the quino checkerspot fall within the recovery units defined in the *Draft Recovery Plan*. In turn, nearly all of the recovery units fall within the Survey Areas map released by the Service. While the *Draft Recovery Plan* imposes no binding restrictions or regulatory burden on landowners and managers, it serves as an important information source for landowners regarding conservation needs for the quino checkerspot habitat areas. Because this document is made publicly available through the publication of a Notice of Availability in the Federal Register, it may receive more wide dispersal than the locally-distributed Survey Areas map. In addition, it publicizes detailed information about quino checkerspot sighting locations. In conjunction with the Survey Areas map, the draft Recovery Plan provides information to the public about areas likely to be subject to consultation with the Service.

2.1.3 Overlap with Other Listed Species

32. Generally, if a consultation is triggered for any listed species, the consultation process will also take into account all species known or thought to occupy areas on or near the project lands. The Service field office in Carlsbad, California has conducted formal consultations on the quino checkerspot in combination with several species, including the federally-listed coastal California gnatcatcher, Stephens' kangaroo rat, Riverside fairy shrimp, San Diego fairy shrimp, California orcutt grass, least Bell's vireo, Munz's onion, Otago tarplant, and spreading navarretia.
33. Listing or critical-habitat-related protections for other threatened or endangered species may benefit the quino checkerspot as well. For example, two of the proposed quino checkerspot critical habitat units overlap significantly with critical habitat of the California gnatcatcher. Some of the PCEs overlap for these two species, as both make use of sage scrub habitats. However, the quino checkerspot also requires sunny, open patches that contain very specific host plant and nectar source species. This means that while consultations conducted on behalf of the gnatcatcher may provide some benefits to the quino checkerspot, these provisions will not guarantee conservation of quino checkerspot habitat.

¹⁶ U.S. Fish and Wildlife Service, *Draft Recovery Plan for the Quino Checkerspot Butterfly*, February 2001.

34. The net effect of the presence of other federally-listed species in the proposed critical habitat areas for the quino checkerspot is that the number of uniquely quino checkerspot consultations is likely be smaller than would be expected in the absence of these species. Indeed, past consultations on the quino checkerspot involve an average of four species per consultation. Thus, the cost of a consultation that involves quino checkerspot is not fully attributable to the presence of this species or its habitat. Nonetheless, because consultations must consider each listed species separately, a certain amount of research and time will be spent on the quino checkerspot regardless of the presence of other species.

2.1.4 Executive Orders on Tribal Lands

35. Executive Order 13175, entitled *Consultation and Coordination with Indian Tribal Governments* (hereafter "Order") was signed by President Clinton on November 6, 2000. This Order builds on the policies outlined in the Presidential Memorandum of April 29, 1994, entitled *Government-to-Government Relations with Native American Tribal Governments* (hereafter "Memorandum"). Both the Order and the Memorandum state that the executive departments and agencies shall work with federally recognized Indian Tribes on a government-to-government basis. The Order enhances that discussion by stating that, for example:

- The Federal Government shall grant Tribes the maximum administrative discretion possible;
- Federal Agencies shall encourage Indian Tribes to develop their own policies to achieve program objectives and, where possible, defer to Indian Tribes to establish standards;
- No Agency shall promulgate any regulation that has Tribal implications, that imposes substantial direct compliance costs on Indian Tribal governments, and that is not required by statute, unless 1) the funds necessary to pay the direct costs incurred by the Tribe in complying with the regulation are provided by the Federal Government, or 2) the agency a) consults with the Tribal officials early in the process of developing the regulation, b) provides a Tribal summary impact statement in the preamble of the regulation, and c) makes available to the Office of Management and Budget any written communications submitted to the Agency by the Tribal officials;
- Agencies shall review and streamline the processes under which Indian Tribes apply for waivers; and

- Each Agency shall designate an official with the principal responsibility for the agency's implementation of the Order.

36. While the full effect of this Order will depend on its implementation over time, it appears that the net effect is likely to be a reduction in the potential for unfunded section 7 consultations, project modifications, and other impacts associated with the designation of critical habitat for the quino checkerspot on Tribal lands.

2.1.5 State Statutes and Regulations

37. ***California Natural Community Conservation Planning Act.*** Under the California Natural Community Conservation Planning Act (NCCP) of 1991, the California Resources Agency began implementing a pilot program for the protection of coastal sage scrub habitat. The primary goal of this program is "to conserve natural communities and accommodate compatible land use." The program organizes five counties in southern California, including San Diego and Riverside counties, into 11 planning "subregions," which are further divided into "subareas." Each subregion and subarea must design its own habitat conservation plan (HCP) for endangered species, which is submitted to the Service. If approved, these plans allow local communities to manage endangered species on specified reserve areas without having to seek additional section 10 take permits from the Service. The intention is to streamline the administrative efforts of affected parties.¹⁷

38. Since 1991, a number of multi-species habitat conservation plans (MSHCPs) have been approved by the Service in areas that are considered essential to the quino checkerspot. MSHCPs that include adequate provisions for protecting quino checkerspot have been excluded from the proposed designation of critical habitat. However, MSHCPs that do not include adequate provisions for protecting quino checkerspot habitat have been included in the quino checkerspot proposed critical habitat designation.

39. MSHCPs often designate areas where human activities are restricted, and set aside lands as reserves for sensitive and endangered species. In addition, development restrictions in other plan areas may reduce the number of activities that will require consultation on the quino checkerspot with the Service. Thus, even when an MSHCP does not specifically identify the quino checkerspot as a protected species, elements of the plan such as development restrictions may reduce the likelihood that future consultations on the quino checkerspot will be required as a result of critical habitat designation.

40. ***NCCP Efforts in San Diego County.*** The Multiple Species Conservation Program for San Diego County (MSCP) includes conservation programs for 85 endangered,

¹⁷ [Http://www.ceres.ca.gov/CRA/NCCP/intro.htm](http://www.ceres.ca.gov/CRA/NCCP/intro.htm), March 9, 2001.

threatened and sensitive species.¹⁸ The MSCP has been included in the proposed critical habitat designation because it does not presently include provisions for quino checkerspot butterfly protection.¹⁹ Some proposed critical habitat areas occur on lands that have been purchased and set aside as sensitive and endangered species reserves under the MSCP. In addition, a large portion of lands are designated as Biological Core Resource Areas (BRCAs), where development is restricted, and where the county plans future preservation. Under present restrictions, developments planned in BRCAs in coastal sage, sage-chaparral, grassland or bluff scrub habitats must mitigate impacts by purchasing or setting aside lands to offset impacts.²⁰ Staff at the San Diego Planning and Land Use Department, Land Use and Environment Group (LUEG), who oversee the implementation of the MSCP, rarely issue variances that allow projects to go forward that conflict with the goals of the plan.²¹ Thus, development restrictions imposed by the plan are likely to reduce the number of developments that will affect quino checkerspot habitat. Therefore, fewer quino checkerspot consultations may be expected on proposed development as a result of San Diego's MSCP.

41. Although San Diego's MSCP does not include provisions for the quino checkerspot, efforts are underway to amend the plan to include this species. Staff at the San Diego Planning and LUEG staff predict that adding the quino checkerspot to the plan will result in additional management directives from the County, such as the requirement of development buffers around quino checkerspot sightings and measures to prevent invasive species from affecting host plants.²² Amendment efforts began prior to the proposal to designate critical habitat for the quino checkerspot, and pertain mostly to the listing of the species under the Act. Thus the costs attributable to amending the plan to include the quino checkerspot are attributable to the listing of the species under the Act, and are not incremental to the designation of critical habitat for the quino checkerspot.

¹⁸The City of San Diego also has an approved MSCP subarea that is partially included in CH Unit 3. The following discussion applies to both plans.

¹⁹ *Final Multiple Species Conservation Program*, San Diego County, 1998.

²⁰ Restrictions are detailed in the county MSCP Biological Mitigation Ordinance (Ordinance No. 8845). Ratios of impacted area to mitigation area depend on the types of land involved and the specific vegetation types, but ratios vary between 0.5:1 and 3:1. (From Attachment M, Ordinance # 8845.)

²¹ Personal communication with Biologist, Multiple Species Conservation Program, Land Use and Environment Group, San Diego Department of Planning and Land Use, CA, April 4, 2001.

²² Personal communication with Biologist, Multiple Species Conservation Program, Land Use and Environment Group, San Diego Department of Planning and Land Use, CA, March 22, 2001.

42. ***NCCP Efforts in Riverside County.*** The Western Riverside County MSHCP is currently being prepared. The planning area has been included in the designation of critical habitat for the quino checkerspot because it has not yet been completed. Once complete, the area included in the plan will encompass all of the proposed quino checkerspot critical habitat areas that fall in Riverside County. The Service states that the plan is likely to include provisions for the quino checkerspot and its habitat when it is completed (planned for October 2002).²³ In support of this assertion, staff at the Transportation and Land Management Agency of Riverside County indicate that the quino checkerspot is one of the species that is driving the creation of the plan, and that the plan would not likely go forward without it.²⁴ If the completed plan includes quino checkerspot, then activities within the plan area that affect quino checkerspot habitat will not require individual incidental take permits from the Service. However, actions by Federal agencies that may affect the quino checkerspot will still require consultation with the Service.²⁵ The Service expects that these consultations will remain informal if the proposed project falls within the scope of the plan.²⁶ Tribal lands that fall in critical habitat units and the MSHCP in Riverside County will not be subject to restrictions imposed by the MSHCP.
43. The approved subarea plan for the Lake Matthews area has also been included in the proposed designation of critical habitat because it only conditionally covers the quino checkerspot (i.e., if the species is sighted). The 1995 Lake Matthews MSHCP is within the planning boundary of the Western Riverside County MSHCP, and includes 5,993 acres owned by Metropolitan Water District of Southern California. The plan sets aside 5,110 acres for sensitive and endangered species conservation, and includes a 2,565-acre State

²³ Personal communication with Biologist, U.S. Fish and Wildlife Service, Carlsbad Fish and Wildlife Office, March 29, 2001.

²⁴ Personal communication with Staff, County of Riverside, Transportation and Land Management Agency, April 6, 2001.

²⁵ In the San Diego MSCP area, the Service consulted with U.S. Department of Transportation on the California gnatcatcher, San Diego fairy shrimp, least Bell's vireo, and Otay tarplant even though these species are included in the MSCP. (Consultation on State Route 125 construction, February 1999).

²⁶ Personal communication with Biologist, U.S. Fish and Wildlife Service, Carlsbad Fish and Wildlife Office, April 13, 2001. This assertion is supported by evidence from the San Diego MSCP. In MSCP areas, the Service presently makes recommendations for project modifications during a project's public notice period. For projects that may have large impacts on endangered species, the Service often attends meetings with LUEG staff to discuss options, but such activities have remained informal.

Ecological Reserve.²⁷ As stated above, future activities that require consultation with the Service in these areas may be unlikely because reserve areas are already managed to preserve habitat for endangered species.²⁸

44. In addition, the 1996 HCP for the Stephens' kangaroo rat area was included in critical habitat designation for the quino checkerspot because it does not provide provisions for the quino checkerspot. This HCP includes approximately 41,000 acres of reserve lands in seven core reserves, including Lake Matthews-Estelle Mountain (overlaps with Unit 1) and the Lake Skinner-Domenigoni Valley Reserve (overlaps with Unit 2). While the habitat of Stephens' kangaroo rat is somewhat similar to that of the quino checkerspot (scrub habitat and grassland), the kangaroo rat does not rely on the presence of quino checkerspot host plants for survival. This means that while conservation efforts conducted on behalf of the kangaroo rat may provide some benefits to the quino checkerspot, these provisions will not guarantee conservation of quino checkerspot habitat.²⁹
45. ***California Environmental Quality Act.*** The California Environmental Quality Act (CEQA) requires identification of environmental effects of proposed projects that have the potential to harm sensitive species (state or federally listed). The lead agency (typically the California State agency in charge of the oversight of a project) must determine whether a proposed project would have a "significant" effect on the environment. Under CEQA, surveys are conducted in order to determine the environmental effects of proposed projects on all rare, threatened and endangered species. Section 15065 of Article 5 of the CEQA regulations states that a finding of significance is mandatory if the project will "substantially reduce the habitat of a fish and wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of an endangered, rare or threatened species, or eliminate important examples of the major periods of California history or prehistory." If the lead agency finds a project will cause significant impacts, the landowners must prepare an Environmental Impact Report (EIR).³⁰

²⁷ "Lake Matthews MSHCP and Natural Community Conservation Planning Area." Riverside County Habitat Conservation Agency and Metropolitan Water District of Southern California, 1995.

²⁸ Personal communication with Biologist, Carlsbad Fish and Wildlife Office, California, March 29, 2001.

²⁹ "Habitat Conservation Plan for the Stephens' Kangaroo Rat in Western Riverside County, California." Riverside County Habitat Conservation Agency, 1996.

³⁰ California Resources Agency, "Summary and Overview of the California Environmental Quality Act", November 12, 1998, http://ceres.ca.gov/topic/env_law/ceqa/summary.html, August 23, 2000.

46. Any economic impacts identified by the EIR process are due to the presence of a particular species on the project land, whether or not it has been designated as critical habitat by the Service. In quino checkerspot critical habitat areas, CEQA requirements already play a role in requiring biological surveys for the quino checkerspot. Even absent the survey area recommendations from the Service, CEQA requirements would likely have led to biological surveys being conducted for the quino checkerspot in many areas proposed as critical habitat. Thus, biological surveys for the quino checkerspot are unlikely to be incremental to the designation of critical habitat in survey areas.

2.2 Socioeconomic Profile of the Critical Habitat Areas

47. This section summarizes key economic and demographic information for the two counties containing proposed critical habitat for the quino checkerspot. County level data are provided to provide context for the discussion of potential economic impacts due to critical habitat designation, and to illuminate trends that may influence these impacts.³¹
48. Because the majority of the proposed critical habitat occurs in sparsely populated or uninhabited regions, county level data may not accurately reflect the socioeconomic characteristics of these areas. Therefore, a Geographic Information System (GIS) analysis of development pressures and present land uses within critical habitat areas follows the discussion of county level trends.

2.2.1 Riverside

49. Western Riverside County includes most of Units 1 and 2 in the proposed quino critical habitat designation. The area is experiencing a tremendous growth in its population, which has been accompanied by a boom in residential housing development. The recent demand for residential housing has increased property values and resulted in farmlands being converted to residential developments. Overall, Riverside County appears to be in transition from an agricultural economy to an economy based on services and retail trade. These trends have significant implications for future economic activities that will occur within and adjacent to the proposed critical habitat areas for the quino checkerspot.
50. Riverside ranks as the sixth most populous county in the State of California. Riverside's 2000 population exceeded 1.5 million and accounted for about 4.5 percent of

³¹ Population and housing summaries are derived mainly from: State of California, Department of Finance, *City/County Population and Housing Estimates, 1991-2000, with 1990 Census Counts*. Other statistics are derived from the U.S. Bureau of Economic Analysis Regional Facts, <http://www.bea.doc.gov/bea/regional/bearfacts/bf10/06/index.htm>, April 6, 2001, and the *1997 County and City Extra*, George Hall and Deirdre Gaquin, editors (Bernan Press, MD) 1997.

the state total. This population is spread over 7,200 square miles with an average density of 212 people per square mile. Since 1990, Riverside's average annual population growth rate has been 2.7 percent, which is nearly twice the state average of 1.4 percent.

51. For the most part, Riverside County has been experiencing rapid development compared to the rest of California. In 2000, Riverside County had approximately 582,419 housing units.³² This figure results from an average annual housing growth rate of about 1.9 percent since 1990, which is about twice the state average of 0.9 percent. Several municipalities in the vicinity of proposed quino checkerspot critical habitat have housing growth rates that exceed the County's average. These include Temecula (5.7 percent), Murrieta (5.4 percent), Hemet (4.6 percent) and Perris (3 percent). The housing growth rate in other Riverside County municipalities within the vicinity of proposed critical habitat for the quino checkerspot include Canyon Lake (1.0 percent) and Moreno Valley (1.1 percent).³³
52. In 1998, Riverside had a total personal income (TPI) of \$33.2 billion, with a per capita personal income (PCPI) of \$22,451.³⁴ Riverside's PCPI ranked 20 percent lower than the State average (\$28,163) and 17 percent lower than the national average (\$27,203). In 1988, the PCPI of Riverside was \$17,872 and ranked 20th in the State. The average annual income growth rate over the past ten years was 2.3 percent, which is below the average annual growth rate for the State (3.6 percent) as well for the nation (4.6 percent).
53. Total earnings of persons employed in Riverside increased from about \$8.6 billion in 1988 to \$16.3 billion in 1998, an average annual growth rate of 6.6 percent. Farming, which represented the largest industry earnings in 1988 (32.4 percent), shrunk to just 2.4 percent in 1998.³⁵ The largest industries in 1998 were services (23.3 percent of earnings), state and local government (16 percent of earnings), and construction (12.8 percent of earnings).

³² State of California, Department of Finance, "City/County Population and Housing Estimates," 1991-2000, with 1990 Census Counts.

³³ Murrieta and Canyon Lake housing growth estimates are from 1995-2000.

³⁴ Total personal income includes the earning (wages and salaries, other labor income, and proprietor's income); dividends, interest, and rent; and transfer payments received by the residents of Riverside.

³⁵ State of California, Department of Finance, "City/County Population and Housing Estimates," 1991-2000, with 1990 Census Counts.

54. Note that the economics of Tribal lands does not necessarily follow county-wide trends. Of 260 Tribal members living on or near the reservation of the Cahuilla Band of Mission Indians in 1997, 85 were considered to be employed. Work force unemployment was estimated at 46 percent. Thirty-eight percent of those employed were reported to receive wages that were below poverty levels.³⁶ Mean housing value (only patchily recorded) was \$82,366, significantly lower than mean housing value in the rest of Riverside County.³⁷

2.2.2 San Diego

55. San Diego County growth is concentrated in the western region of the county, where Unit 3 of the proposed critical habitat area is located. The vast majority of San Diego County's economic activity described below occurs in the western coastal regions of the county. The eastern region of San Diego County, where Unit 4 is located, is extremely arid. High temperatures, lack of water, and relative isolation from developed areas has resulted in significantly less development pressure in this area.³⁸ Averaged across the county, population and housing growth rates are slower in San Diego than in Riverside County. However, western San Diego County continues to expand very rapidly, and development pressure continues. These trends have significant implications for future economic activities that will occur within and adjacent to the proposed critical habitat areas for the quino checkerspot.
56. San Diego is the second most populous county in the State of California. In 2000, its population of slightly more than 2.9 million accounted for about 8.5 percent of the State total. The estimated average population density for San Diego County is 671 people per square mile, three times more dense than Riverside County. Since 1990, average annual population growth rate in San Diego County has been about 1.5 percent, which is equal to the State average, but is one half of the growth rate being experienced in Riverside County. In 2000, San Diego County had a little more than one million housing units.³⁹ This figure

³⁶ FY 1997 Labor Force Report, Sacramento Area Office, Bureau of Indian Affairs, 1997. Available at <http://www.doi.gov/bia/reports.html>, April 13, 2001.

³⁷ U.S Bureau of the Census. Census Tiger 1995 block digital map layers (California). Accessed at <http://www.census.gov/ftp/pub/geo/www/tiger/> April 6, 2001.

³⁸ Personal communication with Biologist, Multiple Species Conservation Program, Land Use and Environment Group, San Diego Department of Planning and Land Use, CA, March 22, 2001.

³⁹ State of California, Department of Finance, "City/County Population and Housing Estimates," 1991-2000, with 1990 Census Counts.

reflects an average annual housing growth rate of about 0.9 percent since 1990, which is about equal to the state average.

57. In 1998, San Diego had a TPI of \$76.5 billion, which equates to a per capita personal income of \$27,657. San Diego's PCPI ranked 15th in the State, just two percent less than the State average (\$28,163) and two percent higher than the national average (\$27,203). Over the past ten years, the average annual PCPI growth rate has been 3.7 percent, roughly equal to the State average, and 3.6 percent lower than the national average of 4.6 percent.
58. Total earnings of persons employed in San Diego increased from \$32.8 billion in 1988 to \$54.4 billion in 1998, an average annual growth rate of 5.2 percent. The largest industries in 1998 were services (30.7 percent of earnings); State and local government (10.8 percent); and retail trade (9.4 percent). In 1988, the largest industries were services (24.5 percent of earnings); military (13.3 percent); and durable goods manufacturing (10.6 percent).
59. Exhibit 2-4 summarizes the socioeconomic data on Riverside and San Diego Counties presented above.

Exhibit 2-4		
SOCIOECONOMIC CHARACTERISTICS OF RIVERSIDE AND SAN DIEGO COUNTIES IN CALIFORNIA		
Statistic	Riverside County	San Diego County
Population of County (2000)	1,522,855	2,911,468
Percent of State Population	4.5	8.7
Percent Change in Population (1990-1999)	2.7	1.5
Total Full and Part time Employment (1998)	582,568	1,604,887
Unemployment Rate (1999)	5.5	3.1
1998 Full/Part Time Employment (Percent of County Total)		
Industry	Riverside County	San Diego County
Farming	13,732 (2.4%)	15,957 (1.0%)
Agricultural Services	21,077 (3.6%)	24,032 (1.5%)
Mining	914 (0.2%)	1,787 (0.1%)
Construction	50,030 (8.6)	87,422 (5.4%)
Manufacturing	52,141 (9.0%)	139,523 (8.7%)
Transportation/Utilities	17,789 (3.1 %)	54,807 (3.4%)
Wholesale Trade	18,444 (3.2%)	56,668 (3.5%)
Retail Trade	108,411(18.6%)	256,439 (16.0%)

Exhibit 2-4		
SOCIOECONOMIC CHARACTERISTICS OF RIVERSIDE AND SAN DIEGO COUNTIES IN CALIFORNIA		
Finance/ Insurance/ Real Estate	36,596 (6.3%)	125,987 (7.9%)
Services	181,656 (31.2%)	544,813 (33.9%)
Government	81,778 (14.0%)	297,472 (18.5%)
Sources: State of California, Department of Finance, "City/County Population and Housing Estimates, 1991-2000, with 1990 Census Counts." Sacramento, California, May 2000. Accessed at: http://www.dof.ca.gov/html/Demograp/E-5text.htm on April 3, 2001. Regional Economic Information System: 1969-1997 prepared by the Bureau of Economic Analysis, U.S. Dept. of Commerce. The Bureau of Economic Analysis, http://www.bea.doc.gov/bea/regional/reis/ca25/06/index.html , January 4, 2001.		

2.3 GIS Analysis of Development Pressures within Critical Habitat Areas

60. Planners in both San Diego and Riverside counties report that overwhelmingly, the likely future use of private lands included in the designation of critical habitat for the quino checkerspot will be for residential or commercial development. Large developments are likely to require Federal section 404 permits through the Army Corps of Engineers, and thus will have a Federal nexus. Thus, GIS analysis was used to examine the developability and development pressure on private lands within critical habitat areas.

2.3.1 Development Pressure

61. Most of the private lands in the proposed critical habitat designation for the quino checkerspot butterfly are undeveloped. In fact, GIS analysis of land use/land cover data and land ownership data reveals that 95 percent of the private lands in quino checkerspot critical habitat have been classified as native or riparian vegetation.⁴⁰ Further, a large portion of undeveloped lands within the critical habitat designation are developable, according to analysis by the San Diego Association of Governments (SANDAG) and the California Department of Housing and Urban Development (CAHUD).⁴¹

⁴⁰ California Department of Water Resources, Division of Planning and Local Assistance: Santa Ana River Valley land use digital map layers, 1993; San Diego land use digital map layers, 1998. Teale Data Center, Land ownership digital map layer with 2001 update, <http://www.gislab.teale.ca.gov/wwwgis/dataview.html>, April 2, 2001. Land use data was not available for 92,913 acres of land proposed to be included in critical habitat for the quino checkerspot, mostly within Unit 2.

⁴¹ The CAHUD land use analysis presents a range of lands that can be considered developable, but does not consider local or state regulations that may limit development. The CAHUD analysis includes exclusion for floodzones, prime and unique farmlands, wetlands, water

62. Although large portions of the proposed critical habitat units may be developable, development patterns may not be evenly distributed throughout each unit. To determine the likelihood of development occurring within critical habitat areas, a GIS analysis combined the results of an urban growth model with the proposed critical habitat areas. The urban growth model, named California Urban and Biodiversity Analysis (CURBA), can be used to make spatial predictions about the patterns of future urban expansion in California.⁴² By overlaying the proposed critical habitat unit areas over CURBA predictions, some tentative conclusions can be drawn about where development is likely to take place within critical habitat.⁴³
63. This analysis suggests that, despite the general patterns of rapid urban growth in San Diego and Riverside counties, little urban growth is anticipated in critical habitat areas. Using predictions based on current development patterns, this analysis reveals that approximately 9,223 acres are likely to become urbanized within critical habitat areas during the next ten years (approximately three percent of the designation). Exhibit 2-5 shows the distribution of urbanization that is likely to occur in critical habitat units. According to this analysis, the most urbanization relative to the size of the unit will occur in Unit 1 (7.6 percent of Unit 1 is likely to become urbanized), while the most urbanization will occur in Unit 2 (4,438 acres are likely to be developed). According to GIS analysis of model results, urbanization is most likely to occur in the center and the northeast corner of Unit 1. The model also predicts that the westernmost portion of Unit 2, the westernmost branch of Unit 3, and a small area north of I-8 in Unit 4 are likely to become urbanized.

features, and a slope of greater than 15 percent. The SANDAG developability assessment considers some local regulatory constraints to development, such as the inclusion of lands in an HCP preserve.

⁴² Landis, John et al., *California Urban and Biodiversity Analysis (CURBA) model*, Institute of Urban and Regional Development, University of California at Berkeley, September 1998.

⁴³ This analysis used results of CURBA model runs performed by the Institute of Urban and Regional Development, University of California at Berkeley, indicating the possible extent of urban growth by 2020. The "Baseline 2020" digital map layer was used, because it displayed the largest extent of possible urban growth in critical habitat areas, and thus represents the most aggressive development scenario. However, a sensitivity analysis of urbanization figures revealed that an increase or decrease in acreage predicted to become urbanized did not significantly effect the number of estimated consultations that are likely to result from the designation of critical habitat for the quino checkerspot.

Exhibit 2-5 AREA LIKELY TO BECOME URBANIZED IN PROPOSED CRITICAL HABITAT UNITS FOR THE QUINO CHECKERSPOT BUTTERFLY IN THE NEXT TEN YEARS Total Area Expressed in Acres			
Unit	Total Area of Unit	Area to Become Urbanized Over Ten Years	Percent Likely to Become Urbanized by 2020
Unit 1	32,080	2,434	7.6%
Unit 2	173,560	4,438	2.6%
Unit 3	72,470	1,913	2.6%
Unit 4	22,900	438	1.9%
Total	301,010	9,223	3.1%
Sources: U.S. Fish and Wildlife Service, Digital Map layer of proposed critical habitat area for the quino checkerspot butterfly, Carlsbad, CA 2001. Institute of Urban and Regional Development at University of California at Berkeley, 2020 Urban Footprint digital map layers, 2001. CURBA projections were adjusted to reflect a ten year time horizon.			

64. In addition to a coefficient that represents historical urbanization rate, four primary variables dictate the movement of urbanization in the CURBA model: distance to highways, distance to existing urbanization, distance to city centers, and land slope. However, the model does not consider local development restrictions or land ownership in its calculations. Because some lands that are predicted to become urbanized may in fact be designated as park or open space areas, the model is likely to overestimate the amount of growth that is likely to occur. Nonetheless, despite such overestimation, the model shows little urban growth occurring within proposed critical habitat areas over the next ten years even within these rapidly growing counties.

**ECONOMIC IMPACTS OF CRITICAL HABITAT DESIGNATION
ON LAND USE: FEDERAL, TRIBAL, STATE, LOCAL,
AND PRIVATE LAND**

SECTION 3

65. This section addresses specific economic impacts of critical habitat designation for the quino checkerspot on landowners in the proposed designation area. To determine impacts, the analysis examines the combined effect of existing and proposed land use regulations with existing and potential land uses. The analysis further examines the likelihood of future consultations with the Service by identifying potential Federal nexuses associated with land use activities.
66. Economic effects of critical habitat designation for the quino checkerspot will depend on present and future land uses in affected areas, as well as vegetation cover and consultation history with the Service. Note that because consultations have rarely been conducted solely on the quino checkerspot, the cost of these consultations may not be entirely caused by the inclusion of the quino checkerspot. While estimates of future actions and likely consultations are presented in this section, a full explanation of the methodology used to calculate the number of incremental impacts and costs is described in Section 4, "Estimated Costs of the Designation of Critical Habitat for the Quino Checkerspot" of this report.
67. A few cities and local agencies have prepared long range master plans or general plans that indicate the type of development and/or construction that will occur in the long term. However, the majority of the landowners and managers in the proposed critical habitat areas do not have specific plans beyond a five or ten-year time horizon. For landowners and managers that do not plan ten years into the future, this analysis attempts to predict future land use and development activities based on historic trends and one and two-year plans. Predictions beyond ten years become highly speculative and cannot account for exogenous factors such as technology change or shifts in local, regional, and national socioeconomic trends. Therefore, due to uncertainty regarding future technological and economic changes and the planning horizons of many of the landowners and managers in the region, a ten-year time horizon is used throughout this report.

68. Below, specific potential impacts of critical habitat designation are presented, organized by unit and landowner.

3.1 Impacts of Critical Habitat Designation on Unit 1

69. Unit 1 is the smaller of two units in Riverside County. According to the proposed rule for quino checkerspot critical habitat, Unit 1 is 38 percent occupied. Thus, a portion of this unit has already been subject to consultation because of the listing of the species under the Act. Most, but not all, of this unit is included in the 2000 Quino Checkerspot Survey Areas map created by the Service. Thus, either as a result of CEQA requirements or due to the listing of the species under the Act, most areas in Unit 1 may have been regularly surveyed for the presence of the quino checkerspot.⁴⁴ Approximately 3,220 acres in the north side of Unit 1 (10.1 percent of Unit 1) were not included in the Survey Areas map, and thus may not have been regularly surveyed under the listing of the quino checkerspot.⁴⁵
70. Note that all of Unit 1 is expected to be included in the Western Riverside County MSHCP when it is completed (anticipated for October 2002). The Service anticipates that, if the Service issues an incidental take permit for this MSHCP, most future consultations on the quino checkerspot are likely to remain informal, as long as proposed developments fall within the plan guidelines.⁴⁶ Effects on specific landowners are described below.

3.1.1 Bureau of Land Management Lands

71. The Bureau of Land Management (BLM) is the largest Federal landowner in the designation of critical habitat for the quino checkerspot, and manages lands in all four proposed units. Unit 1, however, contains relatively few BLM land parcels. Nonetheless, because BLM is a Federal agency, a Federal nexus exists for all activities that may affect listed species on BLM lands.

⁴⁴ Local agencies such as LUEP use recommendations by the Service in their determinations of whether CEQA surveys will be required.

⁴⁵ Internal IEc GIS analysis overlaying critical habitat unit areas with 2000 Survey Areas.

⁴⁶ Personal communication with Biologist, U.S. Fish and Wildlife Service, Carlsbad Fish and Wildlife Office, April 13, 2001.

72. BLM lands in Unit 1 are primarily used for grazing and conservation activities. Regarding grazing activities, BLM is presently conducting an informal consultation with the Service regarding the renewal of a sheep grazing lease in quino checkerspot habitat.⁴⁷ Because grazing activities in Unit 1 have already been subject to consultation under the listing of the species, future consultations on grazing would be attributable to the listing of the species, and would not likely be incremental to the designation of critical habitat.
73. In conservation areas, human access is limited and development, grazing, and off-road vehicle use are prohibited. Conservation areas are managed to preserve habitat for sensitive species. Although management of these areas is designed to conserve wildlife habitat, it is unclear at this time whether BLM is managing for the quino checkerspot in Unit 1. Because management activities for other species could conflict with the management needed for the quino checkerspot, it is possible that a future consultation may occur in the next ten years on the quino checkerspot. Because no consultations have occurred regarding conservation activities on BLM in Unit 1 in the past, this consultation represents an upper bound estimate of considered incremental to the designation of critical habitat for the quino checkerspot.

3.1.2 U.S. Department of Transportation/California Department of Transportation Lands

74. The U.S. Department of Transportation's Federal-Aid Highway Program "provides Federal financial assistance to the states to plan, design, construct and improve the National Highway System, which includes the interstate system and other major urban and rural roads. The program also provides funding support to enhance safety and improve the operation of the locally important highways and roads."⁴⁸ Planners at the Southern California Association of Governments (SCAG) state that a large portion of state and local road projects receive some Federal funding, and thus have a potential Federal nexus.⁴⁹ The Draft 2001 Regional Transportation Plan (RTP) for six counties in southern California states that in recent decades, highway system building has shifted its focus away from building new roads towards building High-Occupancy Vehicle (HOV) lanes, rail facilities,

⁴⁷ Personal communication with Biologist, Bureau of Land Management, Palm Springs Office, February 12, 2001.

⁴⁸ [Http://www.fhwa.dot.gov/resourcecenters/western/](http://www.fhwa.dot.gov/resourcecenters/western/), April 4, 2001.

⁴⁹ Personal communication with Senior Planner, Southern California Association of Governments, April 4, 2001; Personal communication with Regional Transportation Plan Manager, Southern California Association of Governments, April 11, 2001.

and privately-funded toll roads.⁵⁰ Indeed, the California Department of Transportation (CalTrans) is not presently conducting any large road construction projects in Unit 1.⁵¹ Further, according to the Draft 2001 RTP, no Regionally Significant Baseline Projects (i.e., funded major transportation projects) are planned in this unit in the next 20 years.⁵² Unit 1 should also not be affected by HOV lane expansion because no large highways presently cross this unit. These projections, combined with the present focus away from new highway building, suggests that the likelihood of future consultations in the next ten years that result from the designation of critical habitat for the quino checkerspot in Unit 1 is low.

3.1.3 Metropolitan Water District of Southern California.

75. Nearly 6,000 acres in Unit 1 are owned by Metropolitan Water District of Southern California and are managed as part of the Lake Matthews MSHCP. As stated in the Baseline Elements section, the Lake Matthews plan sets aside most of these lands for conservation, including a state-managed Ecological Reserve.⁵³ Activities in conservation areas may be subject to Clean Water Act section 404 permits from the Army Corps of Engineers (ACOE), and thus have a Federal nexus. However, activities in conservation areas are unlikely to adversely affect the quino checkerspot, as these areas are expressly managed to conserve endangered species, including the quino checkerspot. Thus, the potential for future consultation in these areas is low.
76. The Lake Matthews MSHCP also designates the remaining 883 acres of Metropolitan property for operations and projects by water district facilities. However, these operations areas were excluded from the designation of critical habitat designation for the quino checkerspot. Thus, no impacts as a result of critical habitat designation are anticipated. Nonetheless, Metropolitan staff are likely to contact the Service for information after the designation of critical habitat for the quino checkerspot. Thus, this analysis

⁵⁰ While HOV lane miles in six southern counties are expected to increase by 105 percent, freeway lane miles are only expected to increase 10 percent (slightly more if funding is received). "Regional Transportation Plan Draft, Community Link 21: 2001 Regional Transportation Update," Southern California Association of Governments, 2000.

⁵¹ The State of California, Department of Transportation is responsible for the design, construction, maintenance, and operation of the California State Highway System, as well as that portion of the Interstate Highway System within the state's boundaries. [Http://www.dot.ca.gov/dist8/projects/projects.htm](http://www.dot.ca.gov/dist8/projects/projects.htm), April 3, 2001.

⁵² "Regional Transportation Plan Draft, Community Link 21: 2001 Regional Transportation Update," Southern California Association of Governments, 2000.

⁵³ "Lake Matthews MSHCP and Natural Community Conservation Planning Area." Riverside County Habitat Conservation Agency and Metropolitan Water District of Southern California, 1995.

estimates that ten technical assistance calls (TAs) are likely in the next ten years in this area.

3.1.4 Riverside County Lands

77. The vicinity of Harford Springs County Park, an area where quino checkerspot has recently been sighted, is included in Unit 1. This park has trails that are open to the public for hiking and equestrian use during the day. Staff at the County Department of Parks and Recreation report that the area is managed to maintain its natural resources, although it is not fenced and is subject to illegal trespass and dumping. Plans are in place to build a small parking lot (less than one acre), but no clear Federal nexus exists that would trigger a consultation with the Service. Because there is no clear Federal nexus at this park, future consultations with the Service on quino checkerspot are unlikely. Further, this area would be subject to consultation under the listing of the species because it is in close proximity to a recent sighting of quino checkerspot. Thus, any future consultations would be attributable to the listing and are not incremental to the designation of critical habitat.⁵⁴ However, Riverside County staff are likely to contact the Service for information after the designation of critical habitat for the quino checkerspot. Thus, technical assistance calls are likely.

3.1.5 Private lands

78. Private lands make up 27,820 acres (87 percent) of Unit 1. According to GIS land use analysis, private lands in Unit 1 are primarily undeveloped. Fewer than 1,000 acres of this unit are used for citrus or tilled crops.
79. Because existing agricultural lands and developed areas are unlikely to contain the primary constituent elements required by the quino checkerspot, consultations with the Service are not likely to be required in these areas in the next ten years.⁵⁵ Some private lands are used as right-of-ways for telecommunications towers and fiber optic lines. While telecommunications towers and fiber optic lines require permits from the Federal Communications Commission (FCC), the Service has not consulted with this agency in the past. However, the Service anticipates that a programmatic consultation with FCC may occur in the next ten years regarding the installation of telecommunication towers in Units 1 and 2.⁵⁶ In addition, the Service anticipates that a programmatic consultation may occur

⁵⁴ Personal communication with Staff, Riverside County Department of Parks and Recreation, CA, April 12, 2001.

⁵⁵ Personal communication with Biologist, U.S. Fish and Wildlife Service, Carlsbad Fish and Wildlife Office, March 29, 2001.

⁵⁶ Personal communication with Biologist, U.S. Fish and Wildlife Service, Carlsbad Fish and Wildlife Office, June 12, 2001.

regarding the installation of fiber optic cables in Units 1 and 2. Because no consultations have occurred regarding these FCC activities in the past, these two consultations are considered incremental to the designation of critical habitat for the quino checkerspot. The remaining developed acres in Unit 1 are used for residential or commercial development.⁵⁷

80. Regarding currently undeveloped private lands, GIS analysis of CURBA model estimates found that 2,434 acres in Unit 1 will become urbanized during the next ten years (7.6 percent of Unit 1). Because Riverside County is in transition from an economy based on agriculture to one based on services and tourism, urbanization in the next ten years is likely to mainly consist of residential and light commercial development. Thus, future consultations on projects with a Federal nexus in this unit are likely to be associated with these activities.
81. Because 90 percent of Unit 1 occurs within the 2000 Quino Checkerspot Survey Areas map, biological surveys are likely to have been conducted associated with the listing of the species under the Act in these areas. However, surveys may not have been conducted on the 10 percent of the unit which was not included in the survey area. Thus, these surveys would represent an additional incremental cost in these previously unsurveyed areas. The Service is also likely to receive inquiries that require technical assistance from landowners who are unaware of the critical habitat boundaries or the requirements inherent in the designation.
82. Large development projects may require Federal Clean Water Act permits from the ACOE, and thus will have a Federal nexus. However, some of the projects proposed in quino checkerspot habitat may have neither a Federal nexus nor primary constituent elements, and so will not require consultation with the Service. In addition, some of these projects will occur in locations where quino checkerspots have been recently sighted. Consultations on such projects would have occurred absent critical habitat and thus are not incremental to the designation of critical habitat for the quino checkerspot. Thus, 3 to 16 consultations are anticipated to occur on private lands that have not been previously subject to consultation on the quino checkerspot in Unit 1 over the next ten years.⁵⁸
83. As stated above, the Service states that future consultations on the quino checkerspot are likely to remain informal if the Western Riverside MSHCP is successfully completed and approved, as long as proposed developments fall within plan guidelines.

⁵⁷ Land use digital map layers, California Land and Water Resources Department, CA, 1998;1993.

⁵⁸ For methodology, see the "Estimated Number of Incremental Surveys, Consultations and Technical Assistance" section of this report for calculations.

3.2 Impacts of Critical Habitat Designation on Unit 2

84. Unit 2 is the largest unit in the proposed critical habitat designation (173,560 acres), and includes lands in both Riverside and San Diego counties. Unit 2 is entirely encompassed in the 2000 Quino Checkerspot Survey Areas map created by the Service. Therefore, the unit has been regularly surveyed for quino checkerspot under the listing of the species under the Act. The Service considers Unit 2 to be 94 percent occupied by the quino checkerspot. Thus, most areas in Unit 2 are subject to consultation under the listing of the species under the Act. The Service anticipates that, if the Service issues an incidental take permit for the Western Riverside County MSHCP, most future consultations on the quino checkerspot are likely to remain informal, as long as proposed developments fall within the plan guidelines.⁵⁹ While most of the unit falls in Riverside County, approximately 11,780 acres of Unit 2 fall in San Diego County.⁶⁰ These lands should be covered by the North County Subarea Plan for San Diego County, which should be completed in 2003.⁶¹

3.2.1 Bureau of Land Management Lands

85. BLM manages a number of parcels in Unit 2, predominantly in the southeastern section. Because BLM is a Federal agency, a Federal nexus exists for all activities that may affect endangered species on BLM lands. BLM lands in Unit 2 are primarily used for grazing and conservation. Some small-scale gold-mining may also occur.
86. Grazing allotments in this area have not been reviewed since the quino checkerspot was listed, but are reviewed every five years. Absent critical habitat designation for the quino checkerspot, BLM already plans to consult with the Service on these renewals.⁶² Therefore, because grazing activities in Unit 2 are subject to consultation under the listing of the species, future consultations on grazing would be attributable to the listing of the species, and would not be incremental to the designation of critical habitat.
87. In conservation areas, human access is limited; development, grazing, and off-road vehicle use are prohibited. Conservation areas are managed to preserve habitat for sensitive species. Because management of these areas is designed to conserve wildlife habitat,

⁵⁹Tribal lands in Unit 2 are not subject to requirements of the MSHCP.

⁶⁰ Internal IEc GIS analysis. Overlay of critical habitat areas with Riverside-San Diego county boundary.

⁶¹ Personal communication with Planner, San Diego Department of Planning and Land Use, March 22, 2001.

⁶² Personal communication with Biologist, Bureau of Land Management, Palm Springs Office, February 12, 2001.

activities that may affect quino checkerspot are not likely. Further, because this unit is considered to be 94 percent occupied by the quino checkerspot, it is likely that BLM is already managing for the quino checkerspot in conservation areas in Unit 2. Thus, any future consultations with BLM are likely to have occurred absent critical habitat designation. Thus, no future incremental consultations with the Service are predicted in these areas.

88. Gold-mining activities have the potential to affect quino checkerspot and their habitat, depending on the method of mining that is used. Because BLM has been proactive in initiating consultations with the Service for other activities in this area, it is likely that BLM would have initiated consultation on mining activities under the listing of the species under the Act if such activities were considered to be detrimental to the quino checkerspot.⁶³ However, no past consultations on gold mining have occurred in this area. Based on this history of consultations with the Service, future consultations specific to gold mining in the future are unlikely. Nonetheless, future consultations would be attributable to the listing of the species under the Act because this area has been considered to be occupied under the listing of the species under the Act.

3.2.2 U.S. Forest Service Lands

89. U.S. Forest Service lands (USFS) are included in Unit 2, including relatively small portions of San Bernardino and Cleveland National Forests. Some of these areas may contain the necessary primary constituent elements for the quino checkerspot.⁶⁴ Because the USFS is a Federal agency, a Federal nexus exists for all activities that may effect endangered species on USFS lands.
90. In San Bernardino National Forest, proposed critical habitat lands occur on the edge of the forest in the San Jacinto district. Land uses within this border area are limited to hiking and occasional off-road vehicle use. The Service recently consulted on a large, programmatic consultation with the USFS regarding daily operations effects on the behavior and management of endangered species (including the quino checkerspot) at the San Bernardino National Forest.⁶⁵ Because the USFS is likely to manage for the quino checkerspot after this consultation, it is unlikely that they will conduct future activities that may affect the quino checkerspot in the area proposed as critical habitat. Thus, future

⁶³ Personal communication with Biologist, U.S. Fish and Wildlife Service, Carlsbad Fish and Wildlife Office, April 13, 2001.

⁶⁴ Personal communication with Biologist, Cleveland National Forest, April 9, 2001.

⁶⁵ Personal communication with Biologist, San Jacinto District, San Bernardino National Forest, April 10, 2001.

consultations with the Service that are incremental to the designation of critical habitat for the quino checkerspot are unlikely in the next ten years.

91. In Cleveland National Forest, critical habitat areas include extreme border areas and one isolated patch of forest. The isolated patch, known as Oak Grove, is used as a fire station by the USFS, and houses several buildings, a parking area, fueling tanks, fire engines, and other firefighting apparatus. The Forest Service reports that this area is heavily disturbed. The Forest Service has also slated the Oak Grove station for \$3 million dollars in improvements, including a new three-bay fire station and offices, as well as barracks for 20 people.⁶⁶ USFS has recently completed a large, programmatic consultation with the Service in Cleveland National Forests regarding daily operation behavior and management of endangered species, including the quino checkerspot. Biologists at Cleveland National Forests anticipate consulting with the Service on both the fire station operations and the improvements plan if critical habitat is designated in this area.⁶⁷ Thus, two future consultations with the Service are anticipated in Cleveland National Forest over the next ten years. These two consultations are incremental to the designation of critical habitat because the Forest would not have consulted with the Service on these activities absent critical habitat designation. However, because the area is already heavily disturbed, Oak Grove consultations may remain informal.

3.2.3 U.S. Department of Transportation/California Department of Transportation Lands

92. As in Unit 1, specific funding sources for state and local road projects are determined on a case-by-case basis, but planners at the Southern California Association of Governments state that a large portion of state and local road projects receive some Federal funding, and thus have a potential Federal nexus. Presently, one large highway intersects Unit 2 (State Route 79), and one U.S. interstate highway runs along its border (Route 215). According to the RTP, it appears likely that both of these roads will be expanded with HOV lanes in the future. A Federal nexus exists for Route 215, and is likely to exist for State Route 79. Although these roads primarily run through urbanized areas, it is possible that HOV expansion could affect areas that contain the primary constituent elements for quino checkerspot habitat. Thus, a future consultation with the Service is possible on each of these two highway projects.
93. The Service has not addressed the quino checkerspot in its consultations on freeway building or expansion in Riverside County, although the Service has conducted

⁶⁶ Public comment on the *Quino Checkerspot Butterfly Draft Recovery Plan* from Forest Supervisor, Cleveland National Forest, March 26, 2001.

⁶⁷ Personal communication with Biologist, Cleveland National Forest, April 10, 2001.

consultations regarding other species for these activities. Because these activities generally span large areas, it is likely that highway expansion activities will occur in areas that would not have been subject to consultation under the listing of the species under the Act. Thus, future consultations with the Service on these highway projects in Unit 2 are considered incremental to the designation of critical habitat for the quino checkerspot. This analysis estimates that two incremental consultations will occur on highway projects in Unit 2 over the next ten years.

3.2.4 Cahuilla Band of Mission Indians

94. Of the 18,884-acre reservation for the Cahuilla Band of Mission Indians, 10,890 acres (57.7 percent of the reservation) have been proposed to be designated as critical habitat for the quino checkerspot. On reservation areas that fall within critical habitat, land use activities include grazing, agriculture (tilling for crops), as well as commercial and residential development. The Tribe also runs a bioremediation facility and mines sand and gravel on lands that may fall within critical habitat areas. The Bureau of Indian Affairs (BIA) reports that the Tribe also has submitted plans to build a large industrial park on the reservation. Land use on the reservation is primarily governed by a land use and development ordinance, which allots Tribal lands to specific Tribal families. The Tribe does not have a Natural Resource Management Plan, and thus is unlikely to be presently managing for quino checkerspot habitat.⁶⁸ The BIA oversees most land-disturbing activities that the Tribe conducts, including realty issues, mining, and forest management. Thus, after the designation of critical habitat on Cahuilla lands, several consultations are likely to occur with the Service regarding the land-disturbing activities listed above.
95. The BIA reports that no consultations have occurred on the Reservation regarding the quino checkerspot, although several have been conducted on other species in the past.⁶⁹ Due to the lack of previous consultation activity in this area, it appears that the Cahuilla lands have not been considered to be occupied by the quino checkerspot under the listing.⁷⁰ Thus, future consultations with the BIA on the quino checkerspot are considered to be incremental to the designation of critical habitat. It is also likely that the Cahuilla Tribe will contact the Service for information and other technical assistance as a result of critical habitat designation. This analysis estimates that 4 future consultations and 20 technical

⁶⁸ Personal communication with Staff, Bureau of Indian Affairs, Riverside Office, April 10, 2001.

⁶⁹ Personal communication with Staff, Bureau of Indian Affairs, Riverside Office, April 10, 2001.

⁷⁰ The Service also indicates that they may not have been aware of Tribal activities in this area.

assistance calls will occur over the next ten years.

3.2.5 Metropolitan Water District Lands

96. Metropolitan Water District of Southern California owns lands in Unit 2 surrounding Lake Skinner reservoir that are managed as part of the Stephens' kangaroo rat HCP. This HCP includes approximately 41,000 acres of reserve lands in seven core reserves, including the Lake Skinner-Domenigoni Valley Reserve, which overlaps with Unit 2. In reserve areas, human use is limited to walking on trails; grazing and off-road vehicle use are prohibited. Areas outside the reserve areas are used for operations of water district facilities and recreation, including RV camping, fishing, boating, and equestrian.⁷¹
97. In areas used for recreation and operations, effects on quino checkerspot habitat are possible. It is also likely that land-altering activities would require a Federal permit from the ACOE or the Environmental Protection Agency (EPA) due to the proximity of this area to public drinking waters, and thus would have a Federal nexus. However, the Service has excluded many of the operations areas surrounding Lake Skinner from the designation of critical habitat, leaving only visibly undeveloped areas. In addition, the Supervising Ranger at Lake Skinner Recreational Area states that no development projects are presently planned for recreational areas.⁷² Finally, this unit is considered to be 94 percent occupied by the quino checkerspot. Therefore, most future consultations in this area would be associated with the presence of quino checkerspot, and would have been subject to consultation under the listing of the species under the Act. Because no development projects are planned and most of the area is considered to be occupied by the quino checkerspot, future impacts are unlikely.
98. Although management of reserve areas is designed to conserve wildlife habitat, it is unclear at this time whether Metropolitan is managing for the quino checkerspot in Unit 2, as such management is not required by the Stephens' kangaroo rat HCP. It is possible that some management activities could require Federal permits from ACOE or EPA, and thus have a Federal nexus. Because management activities for other species could conflict with the management needed for the quino checkerspot, it is possible that a future consultation on the quino checkerspot could occur in the next ten years on Metropolitan lands in Unit 2. Thus, this analysis estimates that one future consultation with Metropolitan will occur in Unit 2 in the next ten years as a result of critical habitat designation.

⁷¹ Personal communication with Supervising Ranger, Lake Skinner Recreation Area, March 22, 2001.

⁷² Personal communication with Supervising Ranger, Lake Skinner Recreational Area, Riverside, CA. March 22, 2001. Also [Http://www.co.riverside.ca.us/activity/parks/mapslist.htm](http://www.co.riverside.ca.us/activity/parks/mapslist.htm), January 22, 2001.

3.2.6 Private Lands

99. Private lands make up 132,810 acres (76.5 percent) in Unit 2. While the majority of this unit appears to be undeveloped, small portions of the unit have recently been used for growing grain, hay fields, and pasture.⁷³ A private conservation mitigation bank for endangered species also exists in the eastern portion of the unit. Because existing agricultural lands and developed areas are unlikely to contain the primary constituent elements for the quino checkerspot, future consultations with the Service are not likely in these areas.⁷⁴ Conservation mitigation bank lands are managed to preserve habitat for sensitive species. Because these lands were set aside to mitigate for lost habitat elsewhere, activities that may affect quino checkerspot habitat in this area are not likely. Thus, no future consultations with the Service are predicted in conservation bank areas.
100. In the past, at least five formal consultations have been conducted that involve the quino checkerspot and large, residential developments in the vicinity of Unit 2. Some of these consultations resulted in the formation of HCPs for the quino checkerspot, and consequently have been left out of the proposed designation. However, lands immediately adjacent to HCP areas have been included in the designation. These adjacent lands occur in the westernmost portion of the unit, which is the same portion that, according to the CURBA model, is likely to become urbanized by 2020. Housing values are also highest in the westernmost part of the unit, implying that demand for property is high.⁷⁵ Because Riverside County is in transition from an economy based on agriculture to one based on services and tourism, urbanization in the next ten years is likely to mainly consist of residential and light commercial development. Thus, future consultations in this unit are likely to be associated with these activities when a Federal nexus exists.
101. GIS analysis of CURBA model estimates found that approximately 4,438 acres in Unit 2 will become urbanized during the next ten years (2.6 percent of Unit 2). Some areas where projects occur will not contain the primary constituent elements for the quino checkerspot. Large development projects may require Federal permits from the ACOE, and thus will have a Federal nexus. However, some of the projects proposed in quino checkerspot habitat may have neither a Federal nexus nor PCEs, and so will not require

⁷³ Land use digital map layers, California Land and Water Resources Department, CA, 1998; 1993. "Regional Transportation Plan: Proposed Environmental Impact Report," Southern California Association of Governments, 2001.

⁷⁴ Personal communication with Biologist, U.S. Fish and Wildlife Service, Carlsbad Fish and Wildlife Office, March 29, 2001.

⁷⁵ Median home values in this area were between \$393,000 and \$600,000 in the 1990 census.

consultation with the Service. In addition, some projects will occur in locations where quino checkerspot have been recently sighted. Because the Service considers Unit 2 to be 94 percent occupied and has conducted at least five past consultations on the quino checkerspot in this area, most future consultations in this area are likely to be associated with the presence of quino checkerspot. Such consultations would have occurred absent critical habitat and thus are not incremental to the designation of critical habitat for the quino checkerspot. Thus, between zero and three incremental formal consultations are anticipated to occur as a result of critical habitat designation in Unit 2 over the next ten years.⁷⁶ Also note that the Service states that future consultations on the quino checkerspot are likely to remain informal if the Service issues an incidental take permit for the Western Riverside MSHCP, as long as proposed developments fall within plan guidelines.

102. Private lands in Unit 2 may also be used as right-of-ways for telecommunications towers and fiber optic lines. While installation of such towers and lines requires permits from the Federal Communications Commission, the Service has not consulted with this agency in the past. As noted in the Unit 1 discussion, the Service anticipates that a programmatic consultation with FCC may occur in the next ten years regarding the installation of telecommunication towers in Units 1 and 2.⁷⁷ In addition, the Service anticipates that a programmatic consultation may occur regarding the installation of fiber optic cables for Units 1 and 2. Because no consultations have occurred regarding these FCC activities in the past, these two consultations are considered incremental to the designation of critical habitat for the quino checkerspot.

⁷⁶ For methodology, see the "Estimated Number of Incremental Surveys, Consultations, and Technical Assistance" section of this report.

⁷⁷ Personal communication with Biologist, U.S. Fish and Wildlife Service, Carlsbad Fish and Wildlife Office, June 12, 2001.

3.3 Impacts of Critical Habitat Designation on Unit 3

103. Unit 3 is the larger of two units in San Diego County. This unit is entirely encompassed in the 2000 Quino Checkerspot Survey Area protocol created by the Service. Therefore, the unit has been regularly surveyed for quino checkerspot under the listing of the species under the Act. Unit 3 also falls entirely under the jurisdiction of the approved San Diego County MSCP (and includes lands that overlap with the City of San Diego subarea plan). While these plans do not presently cover quino checkerspot, numerous restrictions on land use are required in this area. In addition, as a result of the listing of the species under the Act, county planners are amending the plan to include the quino checkerspot. Because they address listing issues, additional management directives that may result from the amendment of the quino checkerspot are not attributable to the designation of critical habitat. The Service also considers Unit 3 to be 92 percent occupied by the quino checkerspot. Thus, many areas have been subject to consultation under the listing of the species under the Act. Specific incremental effects of critical habitat designation for the quino checkerspot will depend on present and future land uses in affected areas, as well as vegetation cover and consultation history with the Service. Effects on specific landowners are described below.

3.3.1 Fish and Wildlife Service Lands

104. The Service manages the San Diego National Wildlife Refuge, which falls in Unit 3. The Service already consults and manages for endangered species in this area. Thus, it is unlikely that the Service will propose projects that will have significant impacts on quino checkerspot critical habitat. No intra-agency consultations are anticipated as a result of designation of critical habitat for the quino checkerspot on this Refuge.⁷⁸

3.3.2 Bureau of Land Management Lands

105. The majority of BLM lands in Unit 3 are classified as wilderness areas, primarily as part of the Otay Wilderness Area. Human activity on wilderness areas is restricted; grazing, development, and off-road vehicle use are prohibited. Because BLM is a Federal agency, activities on its lands that may affect endangered species are subject to consultation with the Service. The Service has conducted one consultation with BLM on management of endangered species at the international fuel break at the U.S. border with Mexico that

⁷⁸ Personal communication with Biologist, San Diego National Wildlife Refuge, California, February 12, 2001.

considered the quino checkerspot, among other species.⁷⁹

106. Because wilderness areas are set aside for the protection of wildlife, activities conducted in these areas by BLM are less likely to warrant consultation with the Service regarding impacts on the quino checkerspot than on other BLM lands. Further, the Service considers Unit 3 to be 92 percent occupied by the quino checkerspot, and has already conducted a consultation on the quino checkerspot in this area under the listing of the species under the Act. Thus future consultations in this area would have been conducted absent critical habitat and thus are not incremental to the designation. Nonetheless, the Service states that the past consultation with BLM on the international fuel break will have to be reinitiated after the designation of critical habitat for the quino checkerspot.⁸⁰

3.3.3 U.S. Navy Lands

107. The Navy owns approximately 400 acres in Unit 3. Because the Navy is a Federal agency, a Federal nexus exists for all Navy activities that may affect the quino checkerspot or its critical habitat. The Navy lands in Unit 3, which were formerly used as a Naval Auxiliary Air Station, are presently used as a Naval Space Surveillance Station. As a result, the area is now home to several large dish and pole antennas and several maintenance roads. The Navy clears vegetation from areas around the antennas regularly in order to control for fire and to maintain access. The antenna installations are permanent, and the Navy does not anticipate any land use changes in the future. The Navy has also recently written a Draft Integrated Natural Resource Management Plan (INRMP) pursuant to the Sikes Act for the Space Surveillance Station that identifies sensitive resource areas and management strategies.⁸¹
108. Given the regularity of brush clearing, it is unlikely that PCEs for the quino checkerspot are present in areas near the antennas. In other areas, land use activities are overseen by the Navy Draft INRMP, which should ensure that activities on Navy lands do not adversely effect quino checkerspot habitat. In support of this assertion, the Service states that activities at the Naval Space Surveillance station are unlikely to result in future

⁷⁹ Consultations on a right-of-way used by the Immigration and Naturalization Service on BLM lands are discussed in the "Immigration and Naturalization Service Lands" section.

⁸⁰ Written communication with Biologists, Carlsbad Fish and Wildlife Office, U.S. Fish and Wildlife Service, California, June 8, 2001.

⁸¹ Personal communication with Supervisor, Navy Department of Natural Resources, Southern California, March 22, 2001.

consultations on the quino checkerspot if the lands are maintained in their current state.⁸² Thus, no future incremental consultations are anticipated with the U.S. Navy in Unit 3.

3.3.4 Immigration and Naturalization Service Lands

109. The Immigration and Naturalization Service conducts border patrol activities along the International Border with Mexico in Unit 3. In addition, INS recently took over management of an extinct former Navy Firing Range, and are presently constructing a border patrol station on that site. Because the INS is a Federal agency, a Federal nexus exists for all INS activities that may affect the quino checkerspot or its critical habitat.
110. The Service predicts that the construction of the INS border patrol station will be completed at the time that the critical habitat designation for the quino checkerspot becomes final. Because land-disturbing activities will be completed, and primary constituent elements are not likely to remain, the Service does not expect to consult with the INS on that site in the future. The Service is presently involved in two consultations with the INS on their border patrol activities: 1) a formal consultation regarding maintenance and construction of a border fence that stretches for 14 miles, part of which falls in Unit 3; and 2) an informal consultation on day to day operations of the INS.⁸³ After the completion of these consultations, the Service is likely to consult on individual projects proposed by the INS. Nonetheless, the Service considers Unit 3 to be 92 percent occupied by the quino checkerspot, and has a history of consulting with the INS in this area. Thus, future consultations with the INS are attributable to the listing of the species under the Act, and are not going to be affected by the designation of critical habitat for the quino checkerspot.

3.3.5 U.S. Department of Transportation/California Department of Transportation Lands

111. As stated above, specific funding sources for state and local road projects are determined on a case-by-case basis. However, interstate highways as well as a large proportion of local road projects receive some Federal funding, and thus have a potential Federal nexus. According to SANDAG projections, approximately five major road projects

⁸² Personal communication with Biologist, U.S. Fish and Wildlife Service, Carlsbad Fish and Wildlife Office, March 27, 2001.

⁸³ Personal communication with Biologists, U.S. Fish and Wildlife Service, Carlsbad Fish and Wildlife Office, CA, January 25, 2001; February 15, 2001; March 27, 2001.

are anticipated to affect Unit 3 by 2020.⁸⁴ These activities are likely to lead to future consultations with the Service on the quino checkerspot. However, because the Service considers this unit to be 92 percent occupied, most of the unit has already been subject to consultation under the listing of the species under the Act. This assertion is supported by the fact that the Service has already conducted a formal consultation on the construction of State Route 125 in Unit 3. Thus, most future consultations with Federal Highways in Unit 3 are attributable to the listing of the species under the Act, and are not incremental to the designation of critical habitat for the quino checkerspot. This analysis estimates that approximately one future consultation is likely to occur with Federal Highways on the quino checkerspot critical habitat designation over the next ten years.⁸⁵ In addition, the Service states that the State Route 125 consultation will have to be reinitiated after the designation of critical habitat for the quino checkerspot.⁸⁶ Because project modifications previously required as part of the State Route 125 consultation included extensive compensation for habitat loss, future project modifications as a result of this reinitiated consultation are unlikely.

3.3.6 California Department of Forestry and Fire Protection Lands

112. Nearly 5,000 acres in Unit 3 are managed by the California Department of Forestry and Fire Protection (CDF). These lands, which run along the border with Mexico, are currently classified as "wildlands" by CDF. CDF is responsible for performing controlled burns in this area, and sometimes works with the INS on these activities.⁸⁷ Thus, a Federal nexus exists for some of the burn activities performed by CDF in Unit 3. Nonetheless, the Service considers this unit to be 92 percent occupied, and is already conducting two consultations under the listing with the INS regarding their border patrol activities in this area. Thus, future consultations with the Service are attributable to the listing of the species under the Act, and are not attributable to the designation of critical habitat.

⁸⁴ Future development digital map layers created by the San Diego Association of Governments, 2001.

⁸⁵ For methodology, see the "Estimated Number of Incremental Surveys, Consultations, and Technical Assistance," section of this report.

⁸⁶ Personal communication with Biologist, U.S. Fish and Wildlife Service, Carlsbad Fish and Wildlife Office, March 27, 2001.

⁸⁷ Captain, CA Department of Forestry and Fire Protection, San Diego County, April 26, 2001.

3.3.7 San Diego County Lands

113. Several parcels of San Diego County land (totaling fewer than 400 acres) fall in Unit 3 near Brown Field. GIS analysis revealed that land cover in these areas is primarily native vegetation.⁸⁸ The Service indicates that this area is considered to be occupied by the quino checkerspot.⁸⁹ Thus, this property would already have been subject to consultation under the listing of the species under the Act. Therefore, incremental impacts of critical habitat designation in this area appear unlikely. However, public comments are solicited to determine whether development plans may exist, and whether a Federal nexus may be present in these areas.

3.3.8 City of San Diego Lands

114. A parcel in Unit 3 belongs to the City of San Diego. Staff at the CDF, who manage lands surrounding the parcel, state that this parcel is being managed for wildlife conservation.⁹⁰ No developments presently exist on the parcel, which is located in a remote area near the U.S.-Mexico border. The Service states that the City of San Diego is presently preparing a management plan for this area.⁹¹ No Federal nexuses are known for activities on this property. Further, because the city manages this area for wildlife conservation, it is unlikely to conduct activities that will adversely affect the quino checkerspot. Therefore, incremental impacts of critical habitat designation in this area appear unlikely.

3.3.8 Private Lands

115. Unit 3 contains 41,540 acres of private land (57.3 percent of Unit 3), most of which are undeveloped. The Service has conducted one formal consultation with EPA that addressed quino checkerspot and four other listed species under the Act in this area. The consultation was conducted on the construction of a natural-gas-fired power plant and associated electric transmission lines, roads, gas pipelines, etc. As in Units 1 and 2, private lands in Unit 3 may also be used as right-of-ways for telecommunications towers and fiber optic lines. While such towers require permits from the Federal Communications

⁸⁸ Land use digital map layers, California Land and Water Resources Department, CA, 1993 and 1998.

⁸⁹ Personal communication with Biologist, U.S. Fish and Wildlife Service, March 27, 2001.

⁹⁰ Captain, .CA Department of Forestry and Fire Protection, San Diego County, April 26, 2001.

⁹¹ Written communication with Biologists, Carlsbad Fish and Wildlife Office, U.S. Fish and Wildlife Service, California, June 8, 2001.

Commission, the Service has not consulted with this agency in the past. The Service anticipates that a programmatic consultation may occur in the future with FCC regarding the installation of telecommunication towers in Unit 3.⁹² Because no consultations have occurred regarding FCC activities in the past, this consultation is considered incremental to the designation of critical habitat for the quino checkerspot.

116. GIS analysis of CURBA model estimates found that approximately 1,913 acres in the southwestern section of Unit 3 are likely to become urbanized during the next ten years (2.6 percent of Unit 3). Some areas where projects are projected to occur will not contain the primary constituent elements for the quino checkerspot. Large projects may require Federal wetlands permits from the ACOE, and thus will have a Federal nexus. However, some of the projects proposed in quino checkerspot habitat may have neither a Federal nexus or PCEs, and so will not require consultation with the Service. In addition, because the Service considers Unit 3 to be 92 percent occupied by the quino checkerspot, most of these projects will occur in locations where quino checkerspot have been recently sighted. Thus, consultations on such projects would have occurred absent critical habitat and thus are not incremental to the designation of critical habitat for the quino checkerspot. This analysis estimates that between zero and two future consultations on new development projects will result from critical habitat designation for the quino checkerspot in Unit 3.⁹³ In addition, the formal consultation with EPA may have to be reinitiated to account for potential impacts on critical habitat. The Service states that after the quino checkerspot is added to the San Diego MSCP, consultations are likely to be informal if proposed developments fit within the plan.

3.4 **Impacts of Critical Habitat Designation on Unit 4**

117. Unit 4 is in arid southeastern San Diego County, at the southern tip of the Anza-Borrego desert. This unit is entirely encompassed in the 2000 Quino Checkerspot Survey Area created by the Service. Therefore, Unit 4 has been regularly surveyed for quino checkerspot under the listing of the species under the Act. The Service considers Unit 4 to be 60 percent occupied by the quino checkerspot. Thus, some areas in Unit 4 have already been subject to consultation under the listing of the species under the Act. Eventually, LUEP has plans to create a County of San Diego Multiple Habitat Conservation and Open Space Program (MHCOSP) that will cover Unit 4. However, this plan has been

⁹² Personal communication with Biologist, U.S. Fish and Wildlife Service, Carlsbad Fish and Wildlife Office, June 12, 2001.

⁹³ See the "Estimated Number of Incremental Surveys, Consultations, and Technical Assistance," section of this report.

postponed until at least 2003.⁹⁴ Incremental effects of critical habitat designation for the quino checkerspot will depend on present and future land uses in affected areas, as well as vegetation cover and consultation history with the Service. Effects on specific landowners are described below.

3.4.1 Bureau of Land Management Lands

118. BLM owns approximately 7,330 acres in Unit 4. Generally, due to the lack of water in the harsh desert chaparral environment, these lands are not heavily used for recreation. BLM states that these lands are occasionally used for grazing, small game hunting, camping, and off-road vehicle riding. A portion of BLM lands are also classified as wilderness areas. Human activity on wilderness areas is restricted; grazing, development, and off-road vehicle use are prohibited. Because BLM is a Federal agency, activities on their lands that may affect endangered species are subject to consultation with the Service. Thus, a Federal nexus exists for these activities.
119. In this area, BLM is currently involved in an informal consultation on impacts to the quino checkerspot associated with off-road vehicle use. BLM has also conducted a formal consultation on the installation of fiber optic lines in this area that addresses many species, including the quino checkerspot.⁹⁵ Although BLM has not initiated consultations with the Service regarding potential impacts on the quino checkerspot from grazing activities in this area, this is likely to be the case only because none of the grazing leases have come up for renewal since the listing of the quino checkerspot in 1997. BLM indicates that consultations would have been initiated under the listing of the species if grazing leases had come up for renewal since 1997. Thus, because BLM has already consulted on several activities associated with the quino checkerspot under the listing of the species under the Act, and any future consultations on grazing activities would be associated with the quino checkerspot listing, future consultations with BLM in Unit 4 would not be incremental to the designation of critical habitat for the quino checkerspot.

⁹⁴ Personal communication with Planner, San Diego Department of Planning and Land Use, March 22, 2001.

⁹⁵ Personal communication with Biologist, Bureau of Land Management, El Centro Office, CA, February 12, 2001.

3.4.2 U.S. Department of Transportation/California Department of Transportation Lands

120. As stated above, all interstate highways as well as a large proportion of local road projects receive some Federal funding, and thus may have a Federal nexus. The U.S. Department of Transportation (DoT) is responsible for maintaining Interstate 8, which bisects Unit 4. Any activity that may affect the quino checkerspot, such as road repair or road expansion, would have a Federal nexus and would require a section 7 consultation with the Service.
121. The 2000-2004 Regional Transportation Improvement Program (RTIP) created by the San Diego Association of Governments does not project any major transit projects for Unit 4.⁹⁶ In general, very small proportion of RTIP projects are slated for this eastern portion of San Diego County. If present trends continue, then future consultations on major transit projects in Unit 4 are unlikely in the reasonably foreseeable future. However, road repair or expansion projects along Interstate 8 may occur. Although the highway itself does not contain the primary constituent elements for the quino checkerspot, expansion projects could affect areas containing habitat. Thus a section 7 consultation may be required in the future. Because the Service has not consulted on Interstate 8 on activities that might affect the quino checkerspot, future consultations on Interstate 8 are considered to be incremental to the designation of critical habitat for the quino checkerspot.

3.4.3 California Department of Parks and Recreation Lands

122. California Department of Parks and Recreation (CA Parks) operates Anza-Borrego Desert State Park, whose southern tip is included in Unit 4. Recreation activities such as horseback riding, hiking, and rugged camping constitute the main land uses in this section of the state park. Grazing and hunting are not permitted on state park property. At this time, CA Parks does not have plans for any habitat-altering projects that would involve a Federal nexus in this state park.⁹⁷ Therefore, CA Parks will not likely be economically impacted by the designation of critical habitat for the quino checkerspot.

⁹⁶ San Diego Association of Governments, 2000-2004 Regional Transportation Improvement Program, 2000; SANDAG Major Transit Project digital map layers, accessed February 9, 2001.

⁹⁷ Personal communication with Senior Ecologist, Anza-Borrego Desert State Park, California Department of Parks and Recreation, April 26, 2001.

3.4.4 California Department of Fish and Game Lands

123. The California Department of Fish and Game (CDFG) maintains an ecological preserve in Unit 4 called Walker Canyon, which is adjacent to Anza-Borrego State Park. Activities taking place on the preserve include recreation, such as bird watching, general hunting, and hiking. Although Federal Pittman-Robertson funding may constitute a Federal nexus, CDFG reports that this property was purchased in order to ensure water availability for wildlife, and no plans exist to develop this area.⁹⁸ As a result, section 7 consultations associated with these activities are unlikely to be required. Thus, critical habitat designation for the quino checkerspot should not have any impact on CDFG lands in Unit 4.

3.4.5 San Diego County Lands

124. A small inholding in Anza-Borrego Desert State Park belongs to San Diego County, after being transferred from private owners. This small parcel contains a stone viewing tower, which was built to attract tourists, called Desert View Tower. A Senior Ecologist at Anza-Borrego State park reports that very little activity takes place on this property, and that the park is unaware of any plans to develop this site. Further, due to its remote desert location, this property is unlikely to be suitable for development.⁹⁹ In any case, no foreseeable Federal nexus exists for this property. Thus, future consultations due the designation of this area as critical habitat are unlikely.

3.4.6 Private Lands

125. Unit 4 contains 11,000 acres of private lands, constituting 48 percent of the unit. In 1998, nearly all of the private lands in Unit 4 were undeveloped.¹⁰⁰ A small parcel near Anza-Borrego Desert State Park is used as a trailer park and private camping area. Another parcel is part of an historic railroad right-of-way that runs through Anza-Borrego Desert State Park. A Senior Ecologist at Anza-Borrego Desert State Park states that there has been discussion of restoring the railroad for historic purposes, which may include using funding from the U.S. Department of Transportation. Private lands in Unit 4 are also used as right-

⁹⁸ Personal communication with Biologist, California Department of Fish and Game, South Coast Region, March 26, 2001. Pittman-Robertson funds are provided through the Federal Aid in Wildlife Restoration Act, which began functioning in 1938, and are derived from Federal excise tax on sporting arms, ammunition, archery equipment, and handguns.

⁹⁹ Personal communication with Senior Ecologist, Anza-Borrego Desert State Park, California Department of Parks and Recreation, April 26, 2001.

¹⁰⁰ 1998 GIS Land Use data coverage created by Department of Water Resources, CA.

of-ways for telecommunications towers and fiber optic lines, though less frequently than in the other proposed critical habitat units. While installation of telecommunication towers and fiber optic lines requires permits from the Federal Communications Commission, the Service has not consulted with this agency in the past. As noted in the discussion of Unit 3, the Service anticipates that a programmatic consultation with FCC may occur in the next ten years regarding the installation of telecommunication towers in Units 3 and 4.¹⁰¹ In addition, the Service anticipates that a programmatic consultation may occur regarding the installation of fiber optic cables in the next ten years in Units 3 and 4. These two consultations are considered incremental to the designation of critical habitat for the quino checkerspot.

126. GIS analysis of CURBA model estimates found that 438 acres of Unit 4 is likely to become urbanized during the next ten years (1.9 percent of Unit 4). This estimate supports statements made by the Service and LUEG that development pressure is relatively low in this area at present. Of development projects that occur, some areas will not contain the primary constituent elements for the quino checkerspot. In this arid region, Federal Clean Water Act permits may not be required, even for large developments. Thus, a Federal nexus would not likely exist. As a result of these two factors, proposed development projects in quino checkerspot habitat may not require section 7 consultation with the Service. In addition, because the Service considers Unit 4 to be 60 percent occupied by the quino checkerspot, some projects will occur in locations where quino checkerspots have been recently sighted. Consultations on such projects would have occurred absent critical habitat and thus are not incremental to the designation of critical habitat for the quino checkerspot. In the next ten years, one to two consultations are anticipated to occur as a result of critical habitat designation for the quino checkerspot on private developments in Unit 4.¹⁰² In addition, a formal consultation with the DoT may occur if Federal funds are procured for the restoration of the railroad. After the creation of the County of San Diego Multiple Habitat Conservation and Open Space Program (MHCOSP), it is likely that consultations on developments in quino checkerspot critical habitat would be informal if proposed developments fit within the plan.

¹⁰¹ Personal communication with Biologist, U.S. Fish and Wildlife Service, Carlsbad Fish and Wildlife Office, June 12, 2001.

¹⁰² See the Estimated Number of Incremental Technical Assistance, Surveys, and Consultations for calculations.

3.5 Summary of Impacts on Land Use

127. Exhibit 3-1 summarizes the impacts of critical habitat designation for the quino checkerspot (see following pages).

Exhibit 3-1

**SUMMARY OF POTENTIAL CONSULTATIONS AND IMPACTS OF
PROPOSED CRITICAL HABITAT FOR THE QUINO CHECKERSPOT BUTTERFLY**

Type of Landowner or Manager	Landowner or Manager	Current or Future Activities that May Require Consultation	Federal Nexus	Potential for Technical Assistance Attributable to Critical Habitat*	Potential for New or Reinitiated Consultations or Other Impacts Attributable to Critical Habitat*
Federal	Bureau of Land Management	Recreational trail management	Federal land ownership	n/a	High-1 consultation likely
		Gold mining	Federal land ownership	n/a	Low
		Off-road vehicle use	Federal land ownership	n/a	Low
		Management of grazing allotments	Federal land ownership	n/a	Low
		International fuel break maintenance	Federal land ownership	n/a	High - 1 reinitiation likely
	U.S. Fish and Wildlife Service	Management of National Wildlife Refuge	Federal Land ownership	n/a	Low
	U.S. Forest Service	Fire station development	Federal land ownership	n/a	High-2 consultations likely
		Conservation activities	Federal land ownership	n/a	Low

Exhibit 3-1

**SUMMARY OF POTENTIAL CONSULTATIONS AND IMPACTS OF
PROPOSED CRITICAL HABITAT FOR THE QUINO CHECKERSPOT BUTTERFLY**

Type of Landowner or Manager	Landowner or Manager	Current or Future Activities that May Require Consultation	Federal Nexus	Potential for Technical Assistance Attributable to Critical Habitat*	Potential for New or Reinitiated Consultations or Other Impacts Attributable to Critical Habitat*
	U.S. Department of Defense (U.S. Navy)	Maintenance of open lands for antennas	Federal land ownership	n/a	Moderate
	Immigration and Naturalization Service	Border patrol activities	Federal land ownership	n/a	Low
	U.S. Department of Transportation (Federal Highways)	Highway construction	Federal funding	n/a	High-2 consultations likely (1 new consultation, 1 reinitiation)
		Road expansions	Federal funding	n/a	High-3 consultations likely
		Railroad restoration	Federal funding	n/a	High-1 consultation likely
Tribal	Cahuilla Band of Mission Indians	Grazing activities	Bureau of Indian Affairs oversight	Moderate	Low
		Residential and Commercial Development	Bureau of Indian Affairs oversight	High	High-2 consultations likely
		Sand and Gravel Mining	Bureau of Indian Affairs oversight	High	High-1 consultation likely

Exhibit 3-1

**SUMMARY OF POTENTIAL CONSULTATIONS AND IMPACTS OF
PROPOSED CRITICAL HABITAT FOR THE QUINO CHECKERSPOT BUTTERFLY**

Type of Landowner or Manager	Landowner or Manager	Current or Future Activities that May Require Consultation	Federal Nexus	Potential for Technical Assistance Attributable to Critical Habitat*	Potential for New or Reinitiated Consultations or Other Impacts Attributable to Critical Habitat*
		Bioremediation Facility activities	Bureau of Indian Affairs oversight	Moderate	High-1 consultation likely
		Cropping activities	Bureau of Indian Affairs oversight	Moderate	Low
State and Local	CA Department of Parks and Recreation	Trail maintenance activities at Anza-Borrego Desert State Park	No clear nexus	High	Low
	California Department of Forestry and Fire Protection	Controlled burns Fuel breaks maintenance	Work with INS on projects	High	Low
	CA Department of Fish and Game	Ecological Reserve Management	Federal funding	Low	Low
	Metropolitan Water District of Southern California	Conservation areas	Federal funding or Section 404 permit	High	High - 1 consultation likely
State and Local	Riverside and San Diego Parks	Recreation activities	No clear nexus	High	Low

Exhibit 3-1

**SUMMARY OF POTENTIAL CONSULTATIONS AND IMPACTS OF
PROPOSED CRITICAL HABITAT FOR THE QUINO CHECKERSPOT BUTTERFLY**

Type of Landowner or Manager	Landowner or Manager	Current or Future Activities that May Require Consultation	Federal Nexus	Potential for Technical Assistance Attributable to Critical Habitat*	Potential for New or Reinitiated Consultations or Other Impacts Attributable to Critical Habitat*
	City of San Diego	Recreation activities	Pittman- Robertson funding	High	Low
Private	Private landowners	Residential and commercial development	Section 404 permit	High	High-4-23 consultations likely
		Construction of natural gas fired power plant	Environmental Protection Agency Funding	Low	High-1 reinitiation likely
		Commercial communication towers or fiber optic lines	FCC permit	High	High-4 consultations likely

Sources: Information in table based on personal communications with landowners as well as Service Biologists, Carlsbad, California Office, February-April 2001 (see footnotes and References).

* Note: Any potential new or reinitiated consultation or other impact attributable to critical habitat presumes a pre-existing Federal nexus as identified in the preceding column.

ESTIMATED COSTS OF THE DESIGNATION OF CRITICAL HABITAT FOR THE QUINO CHECKERSPOT

SECTION 4

128. This section describes the total economic costs likely to result from the designation of critical habitat for the quino checkerspot over the next ten years. First, this section presents estimates of the number of incremental surveys, consultations, and technical assistance efforts that are likely to result from the designation of critical habitat for the quino checkerspot. Second, estimated incremental costs of critical habitat designation are presented. These incremental costs fall into two categories: 1) costs associated with incremental surveys, section 7 consultations and technical assistance provided by the Service, and; 2) costs associated with changes in the scope or design of land use activities, such as development projects.

4.1 Estimated Number of Incremental Surveys, Consultations, and Technical Assistance

129. Estimates of the number of incremental surveys and consultations attributable to the designation of critical habitat for the quino checkerspot and the increase in the amount of technical assistance that will be provided are based on several factors, including: 1) the likelihood that a Federal nexus is associated with a project; 2) the likelihood that primary constituent elements occur on the property; and 3) historical data indicating whether the Service has previously consulted on the species in this area. As stated above, the largest number of incremental consultations due to critical habitat is likely to be associated with the "Habitat, No Butterflies" scenario, when surveys find primary constituent elements for quino checkerspot, but no butterflies are found. Specific methodologies for determining the number of incremental surveys, consultations, and technical assistance are described in more detail below.

4.1.1 Surveys

130. Nearly all of the lands proposed to be designated as critical habitat for the quino checkerspot are included are part of the Quino Checkerspot Survey Areas created and published by the Service since 1997. Thus, biological surveys for projects are likely to have been conducted under the listing of the species under the Act in most areas proposed as critical habitat. Thus, future surveys generally are not incremental to the designation of critical habitat for the quino checkerspot. However, ten percent of Unit 1 is outside the 2000 Quino Checkerspot Survey Area, and thus quino checkerspot surveys are unlikely to have been conducted prior to the designation of critical habitat in this area. Future surveys conducted in this section of Unit 1 are therefore considered incremental to the designation of critical habitat for the quino checkerspot. However, based on the area of this region relative to the survey area, this analysis estimates that inclusion of this area will result in fewer than ten additional biological surveys in the next ten years. This calculation assumed that the number of surveys per acre in 2000 (0.00012 surveys/acre/year) is a good indicator of the future survey rate. This calculation is based on a written communication from the Service that 260 biological surveys on the quino checkerspot were conducted in 2000, and GIS analysis of the 2000 Quino Checkerspot Survey Area map, which revealed that the 2000 Survey Area covered 2.2 million acres.¹⁰³ Multiplying this survey incidence rate with the acreage in Unit 1 outside the survey area (3,200 acres) yields an estimate of 0.4 surveys per year, or approximately four surveys over ten years.

4.1.2 Consultations and Reinitiations of Consultation

131. Accounting of impacts described in Section 3 of this report leads to the following estimates of incremental consultations associated with the proposed critical habitat designation for the quino checkerspot:
- Between four and 23 consultations with the Army Corps of Engineers associated with development projects (Units 1, 2, 3 and 4).
 - Six consultations with the U.S. Department of Transportation on the following activities: approximately three road expansions (Units 1 and 4), one highway construction project (Unit 2), one railroad restoration (Unit 4), and one reinitiated consultation on highway construction (Unit 3);

¹⁰³ Written communication with Biologist, U.S. Fish and Wildlife Service, Carlsbad Fish and Wildlife Office, March 30, 2001.

- Four consultations with the Bureau of Indian Affairs on the following activities: sand and gravel mining, commercial development, residential development, bioremediation facility operations (Unit 2);
- Four consultations with the Federal Communications Commission: two programmatic consultations regarding the installation of telecommunications towers and two consultations regarding the installation of fiber optic lines (Units 1, 2, 3 and 4);
- Two consultations with the U.S. Forest Service on fire station improvements and operations (Unit 2);
- Two consultations with the Bureau of Land Management; one consultation on conservation activities (Unit 1) and one reinitiated consultation on the international fuel break (Unit 3);
- One consultation with the Army Corps of Engineers on activities conducted by Metropolitan Water District of Southern California (Unit 2); and
- One reinitiated consultation with the Environmental Protection Agency on power plant construction (Unit 3).

132. Exhibit 4-1 presents the methodology used to estimate the number of incremental consultations associated with development projects. Estimates of acres likely to become urbanized over ten years were derived from CURBA model estimates.¹⁰⁴ Planners at LUEG state that, in these areas, development pressure is primarily from large landowners requesting permits for residential developments.¹⁰⁵ Thus, as a conservative estimate, this analysis assumes that all urbanized acres will be developed as residential housing projects. The low consultation estimate assumes that proposed projects will average 100 acres in size, and that 20 percent of proposed projects will have a Federal nexus and PCEs. These figures are based on historical evidence from quino checkerspot surveys and estimates of typical project size by the Service and others. The high estimate assumes that proposed projects will average 75 acres in size, and that 80 percent of these projects will have a Federal nexus and PCEs. Thus, the high estimate is likely to represent an upper bound estimate of the number of likely incremental consultations.

¹⁰⁴ A sensitivity analysis of these figures found that changing the model results by 25 percent or less resulted in a very small change in the number of estimated incremental consultations.

¹⁰⁵ Personal communication with Planner, San Diego Department of Planning and Land Use, March 22, 2001.

Exhibit 4-1

ESTIMATED NUMBER OF INCREMENTAL FORMAL CONSULTATIONS ASSOCIATED WITH RESIDENTIAL DEVELOPMENT/LIGHT COMMERCIAL DEVELOPMENT ON LANDS PROPOSED AS CRITICAL HABITAT FOR THE QUINO CHECKERSPOT (2001-2011)

Unit	Estimated Acres Urbanized	Estimated Number of Development Projects in Critical Habitat (100 to 75-acre developments)	Estimated Number of Projects with Federal Nexus and PCEs (20% to 80% of projects)	Percent of Unit Not Previously Subject to Consultation Under the Listing	Number of Incremental Formal Consultations on Private Lands
1	2,433	24-32	5-26	62 %	3-16
2	4,438	44-59	9-47	6 %	1-3
3	1,913	19-26	4-20	8 %	0-2
4	437	4-6	1-5	40 %	0-2
Total					4-23
<p>Notes: The number of residential housing projects was calculated by assuming that the area predicted to become urbanized by the CURBA model will be developed as 100-acre residential developments. The number of projects with a Federal nexus and PCEs was calculated by assuming that 20 percent of residential housing projects have these elements, based on historical evidence of surveys and consultations on the quino checkerspot. Percent of unit not previously subject to consultation was based on the assumption that areas which are not known to be occupied by the Service would not generally be subject to consultation under the listing. Because the Service has consulted in some areas that are not known to be occupied, this assumption yields an upper bound estimate of the number of incremental consultations likely to occur.</p>					

133. The estimated number of incremental consultations presented here is suggestive. The actual number of incremental consultations, which may be lower or higher than these estimates, depends on future economic activity within the areas of critical habitat, as well as the decisions of private, state, local, and Federal landowners. In addition, the analytic approach used to derive the estimated number of consultations cannot account for unknown or unforeseen activities and projects. Therefore, the estimates presented here represent reasonable approximations and should not be interpreted as firm predictions.

4.1.3 Technical Assistance

134. Estimates of the number of parties for whom the Service is likely to provide technical assistance were based on landowner type. This analysis assumes that all non-Federal landowners will contact the Service for technical assistance after critical habitat is designated. These landowners include:

- Metropolitan Water District of Southern California

- Cahuilla Band of Mission Indians
- California Department of Forestry and Fire Protection
- California Department of Parks and Recreation
- California Department of Fish and Game
- Riverside County
- San Diego County
- City of San Diego
- Private landowners

135. This analysis estimates that in the next ten years critical habitat designation for the quino checkerspot will result in 180 occasions in which the Service offers technical assistance. The estimate is based on the history of contact of the state/local landowner with the Service and the number of parcels owned by the landowner in the proposed critical habitat area.

4.1.4 Summary of the Number of Incremental Surveys, Consultations, and Technical Assistance

136. This analysis estimates that in the next ten years critical habitat designation for the quino checkerspot will result in the following actions:
- 180 occasions on which the Service offers technical assistance;
 - 10 additional biological surveys;
 - 22 to 41 formal consultations; and
 - 3 reinitiations of consultations initiated under the listing of the quino checkerspot.

In some cases, these actions will involve the Service and another Federal agency only. More often, they also include a third party involved in projects on non-Federal lands with a Federal nexus. Typical third parties include California state agencies, local municipalities, Tribes, and private landowners. Based on historical records, it is likely that the majority of technical assistance efforts and consultations for the quino checkerspot will involve a third party.

Exhibit 4-2 presents the estimated number of technical assistance efforts and consultations likely to occur in the ten years after the designation of critical habitat for the quino checkerspot.

Exhibit 4-2				
TOTAL ESTIMATED NUMBER OF INCREMENTAL CONSULTATIONS ATTRIBUTABLE TO DESIGNATION OF CRITICAL HABITAT FOR THE QUINO CHECKERSPOT (2001-2011)				
Landowner	Technical Assistance	Surveys	Formal/Informal Consultation	Reinitiation of Consultation
Federal	0	0	13	2
Tribal	20	0	4	0
State/Municipal	60	0	1	0
Private	100	10	4 to 23	1
TOTAL	180	10	21 to 41	3
Sources: IEc analysis based on information provided by landowners as well as Biologists, U.S. Fish and Wildlife Service Carlsbad field office.				

137. The estimated number of incremental consultations presented here is suggestive. The actual number of incremental consultations, which may be lower or higher than these estimates, depends on future economic activity within the areas of critical habitat, as well as the decisions of private, state, local, and Federal landowners. In addition, the analytic approach used to derive the estimated number of consultations cannot account for unknown or unforeseen activities and projects. Therefore, the estimates presented here represent reasonable approximations and should not be interpreted as firm predictions.

4.2 Estimated Costs of Incremental Surveys, Consultations, and Technical Assistance

138. Estimates of the cost of an individual consultation were developed from a review and analysis of historical section 7 files from a number of Service field offices around the country. These files addressed consultations conducted for both listings and critical habitat designations. Cost figures were based on an average level of effort for consultations of low, medium, or high complexity, multiplied by the appropriate labor rates for staff from the Service and other Federal agencies. Estimates take into consideration the level of effort of the Service, the Action agency, and the applicant during both formal and informal consultations, as well as the varying complexity of consultations. Costs associated with these consultations include the administrative costs associated with conducting the consultation, such as the cost of time spent in meetings, preparing letters, and the development of a biological opinion. Because an average of four species are involved in quino checkerspot consultations, administrative costs are not likely to be wholly attributable

to the quino checkerspot.¹⁰⁶ Therefore, these consultation costs estimates are likely to represent an upper bound estimate of the costs attributable to the inclusion of the quino checkerspot.

139. Cost estimates for technical assistance are based on analysis of past technical assistance efforts provided by the Carlsbad field office. Technical assistance costs represent the estimated economic costs of informational conversations between landowners or managers and the Service regarding the designation of critical habitat for quino checkerspot. Most likely, such conversations will occur between municipal or private property owners and the Service regarding lands designated as critical habitat or lands adjacent to critical habitat. Costs associated with these phone calls include the opportunity cost of time spent in conversation, as well as staff costs.
140. Per-unit costs associated with formal consultations, informal consultations, and technical assistance calls are presented in Exhibit 4-3.

¹⁰⁶For a list of species that have been involved in quino checkerspot consultations, see section 2.1.3, "Overlap with Other Listed Species."

Exhibit 4-3			
ESTIMATED PER UNIT COSTS OF SURVEYS, CONSULTATIONS AND TECHNICAL ASSISTANCE (2001 dollars)			
Action	Involved Agencies	Low Estimate	High Estimate
Technical Assistance Call	Service	\$50	\$50
	Third Party	\$28	\$210
Biological Survey*	Service	\$0	\$400
	Third Party	\$4,900	\$7,000
Formal Consultation	Service	\$3,100	\$6,000
	Other Federal Agency	\$4,100	\$6,100
	Third Party	\$2,900	\$4,100
Reinitiated Consultation	Service	\$1,000	\$3,100
	Other Federal Agency	\$1,300	\$4,100
	Third Party	\$1,200	\$2,900
<p>*Surveys not otherwise included as part of formal consultations or project modifications.</p> <p>Notes: Consultation costs include all costs of a consultation that involves the quino checkerspot. Because an average of four species are usually involved in these consultations, these estimates are likely to represent an upper bound estimate of the costs incurred by including the quino checkerspot. Low and high estimates primarily reflect variations in staff wages and time involvement by staff. Technical assistance calls also have educational benefits to the landowner or manager and to the Service.</p> <p>Sources: IEC analysis based on data from the Federal Government General Schedule Rates, 1999, Office of Personnel Management, 2000, and information from Biologists in the U.S. Fish and Wildlife Service, Carlsbad Fish and Wildlife Office.</p>			

141. Exhibit 4-4 displays the estimates of total consultation costs associated with the designation of critical habitat for the quino checkerspot. These costs were calculated by multiplying the number of expected incremental consultations or technical assistance calls by the per unit cost of these actions. Based on this analysis, the total incremental cost of consultations attributable to critical habitat designation for the quino checkerspot will range from \$267,000 to \$770,000. The Federal government will incur approximately half of the costs, with the Service incurring costs of \$80,000 to \$268,000 and other Federal agencies incurring costs of \$94,000 to \$262,000. Costs to the State of California, local municipalities, and private landowners may range from \$93,000 to \$240,000.

<p align="center">Exhibit 4-4</p> <p align="center">ESTIMATED TOTAL CONSULTATION COSTS ATTRIBUTABLE TO DESIGNATION OF CRITICAL HABITAT FOR THE QUINO CHECKERSPOT (2001-2011, 2001 dollars)</p>					
Action	Range	Costs to the Service	Costs to Other Federal Agencies	Costs to Third Parties	Total Costs
Technical Assistance	<i>Low</i>	\$9,000	\$0	\$5,000	\$14,000
	<i>High</i>	\$9,000	\$0	\$36,000	\$45,000
Biological Surveys*	<i>Low</i>	\$0	\$0	\$49,000	\$49,000
	<i>High</i>	\$4,000	\$0	\$70,000	\$74,000
Formal Consultation	<i>Low</i>	\$68,000	\$90,000	\$38,000	\$196,000
	<i>High</i>	\$246,000	\$250,000	\$131,000	\$627,000
Reinitiation	<i>Low</i>	\$3,000	\$4,000	\$1,000	\$8,000
	<i>High</i>	\$9,000	\$12,000	\$3,000	\$24,000
Total	<i>Low</i>	\$80,000	\$94,000	\$93,000	\$267,000
	<i>High</i>	\$268,000	\$262,000	\$240,000	\$770,000
<p>*Surveys not otherwise included as part of formal consultations or project modifications. Note: Dollars are presented as nominal figures. Because of the uncertainty in projecting the year in which actions may occur, all actions are assumed to take place in 2001, thus identifying the largest possible cost. Third parties are defined as California state agencies, local municipalities, Tribes, and private parties. Figures have been rounded. Sources: IEC analysis based on data from the Federal Government General Schedule Rates, 1999, Office of Personnel Management, 2000, and information from Biologists in the U.S. Fish and Wildlife Service, Carlsbad Fish and Wildlife Office.</p>					

4.3 Estimated Number and Costs of Project Modifications

142. This analysis provides estimates of the number and costs of several types of project modifications that are likely to be required as a result of critical habitat designation for the quino checkerspot butterfly. These project modifications are anticipated because they have been required in the past as part of consultations that involved the quino checkerspot. Although past consultations were conducted under the listing of the species under the Act, past modifications required by the Service have focused on habitat considerations due to the rarity of the species. Therefore, past project modifications are likely to be good predictors of future project modifications that may be associated with the designation of critical habitat for the quino checkerspot.
143. Note that the Service usually consults on the quino checkerspot in conjunction with several other species (in the past, an average of four species are involved with quino checkerspot). Thus, some project modifications are not entirely attributable to the inclusion

of the quino checkerspot in a consultation. For example, past consultations have required that landowners restore several acres of coastal sage scrub habitat, which are used by several endangered species in that area, including the quino checkerspot. In other cases, project modifications are made to specifically target the quino checkerspot or its habitat. For example, two past consultations involved the establishment of captive breeding and reintroduction programs for the quino checkerspot. The following list includes project modifications which are partially or wholly attributable to the inclusion of the quino checkerspot, and are likely to be included as a part of consultations on quino checkerspot critical habitat:

- **Habitat mitigation and banking.** Most consultations involving the quino checkerspot in the past have resulted in the purchase of quino checkerspot mitigation lands that will be managed for conservation into perpetuity.¹⁰⁷ Future consultations on development or construction projects are likely to involve destruction of some critical habitat, and therefore it is likely that some purchase of mitigation lands may be required. Costs to purchase these lands and provide management funds has ranged from \$175,000 to \$350,000 per development proposal.
- **Presence of a biological monitor.** Past consultations involving the quino checkerspot have required that a Service-approved biologist/monitor is present on construction sites just prior to and during initial grading in order to verify that conservation areas have been properly marked with posts or fencing.¹⁰⁸ In a past consultation with DoT in San Diego County, a biological monitor was required to observe all construction activities and submit a quarterly report to the Service. While this requirement is likely to be included as part of future incremental consultations, costs of hiring a monitor are likely to be attributable to all species involved in the consultation. Further, biological monitoring is often required by state regulations, such as CEQA. Therefore, this project modification is less likely to be attributable to the designation of critical habitat for the quino checkerspot. However, in the event that a consultation involved only quino checkerspot critical habitat, costs could be attributed to this designation. This service is estimated to cost \$1,400 to \$8,800 per project, depending on the complexity and acreage of the project involved.

¹⁰⁷ This analysis assumes that, while some conservation measures may be initiated by the project proponent, these measures would not have been taken unless the proponent felt compelled to.

¹⁰⁸ Biological Opinion on State Route 125 South, San Diego County, California, February 6, 1999; Formal Section 7 Biological Opinion for the Pulte Home Corporation/Silverhawk Development Project, Riverside County, California, February, 2000.

- **Pre-construction surveys.** Adult-focused surveys for the presence of quino checkerspot are usually recommended immediately before commencing construction to ensure all that host plants are avoided and to locate any larvae that may exist within an impacted area. Surveys are specific to the quino checkerspot, and cannot be attributed to the presence of other species. Surveys are likely to continue to be required in future consultations in critical habitat areas to ensure that no butterflies are present. Costs of surveys are estimated at \$4,900 to \$7,000 to conduct the survey, travel, and write a report. Survey costs vary by the size of the project, which dictates the number of surveyors involved.¹⁰⁹
- **Signage.** Past consultations have required that potential human access points onto preserved areas are signed to inform residents of the habitat value of the area. In addition, "highly visible temporary fencing" is required to be set around known habitat areas during construction. While some conserved areas may protect a number of endangered species, other areas may be fenced specifically to protect quino checkerspot habitat. Costs to set fencing vary according to the scope of the project and the materials used to mark the conservation areas. However, costs of fencing are estimated at approximately \$1,000 to \$1,700 per project, including materials and time spent marking habitat.¹¹⁰
- **Captive breeding, reestablishment, and habitat restoration program.** In two past consultations involving large habitat impacts, consultations involving the quino checkerspot have included plans to conduct genetic studies of the quino checkerspot in order to understand the historic and current gene flow of populations. While these programs were not expressly required by the Service in their biological opinions, they were included by affected parties as part of the project proposals.¹¹¹ While it is unlikely that future consultations that involve impacts to quino checkerspot critical habitat will result in the express requirement of such programs, a small number of large proposals may include such a provision in the future. One estimate of the costs to perform a genetic

¹⁰⁹ Estimate based on personal communication with Biologists, Dudek and Associates, Encinitas, CA, April 30, 2001.

¹¹⁰ Estimate based on personal communication with Biologists, Dudek and Associates, Encinitas, CA, April 30, 2001.

¹¹¹ This analysis assumes that project proposals only include provisions that are deemed necessary to gain approval of the Service or other permitting agencies. Therefore, this element of the proposal may be considered a project modification.

study on quino checkerspot butterflies, including costs to hire a technician, do biological screening tests, purchase lab-supplies, and write a report is \$85,000.¹¹²

- **Limits on night lighting.** The illumination of habitat areas at night is discouraged in several past consultations. If used, lights are to be shielded to minimize the lighting of the surrounding habitat. Costs of shielding lights are estimated to be minimal.
- **Construction season limits.** Several past consultations involving the quino checkerspot have recommended limiting the construction season. However, most construction limits are based on nesting seasons for endangered birds, such as the California gnatcatcher. A few past consultations have made recommendations for construction limits that are specific to the quino checkerspot: these recommend that no heavy construction activity occurs within 300 feet of quino checkerspot habitat during the flight season, from approximately February 20 to May 15. However, these constraints are much less limiting than the construction limits associated with endangered birds, where construction has been limited by as much as six months. Further, because heavy construction is only limited within 300 feet of quino checkerspot habitat, most construction activities are likely to be minimally effected by this requirement.

¹¹² "Quino Checkerspot Butterfly (QCB): Approach to conservation of southern San Diego Populations." Proposal from the San Diego Zoo, Appendix A, Biological Opinion on State Route 125 South, San Diego County, California, 1999.

Exhibit 4-5		
ESTIMATED ECONOMIC COSTS ASSOCIATED WITH INDIVIDUAL PROJECT MODIFICATIONS		
Individual Project Modification	Formal Consultation	
	Low	High
Habitat Mitigation and Banking	\$175,000	\$350,000
Biological Monitor Present	\$1,400	\$8,800
Pre-construction Surveys	\$4,900	\$7,000
Signage	\$1,000	\$1,700
Captive Breeding, Reestablishment and Reintroduction Program	\$85,000	\$85,000
Limits on Night Lighting	minimal	
Construction season limits	minimal	
Total Project Modification Costs per project*	\$267,300	\$452,500
<p>*This total includes assumes that a consultation includes all individual project modification costs listed above. In fact, many consultations may not include every individual project modification (see next Exhibit).</p> <p>Sources: Based on conversations with Dudek and Associates, Encinitas, CA, April 2001 and biological opinions written as part of formal consultations on the quino checkerspot.</p>		

4.3.1 Total Costs of Project Modifications Resulting from Critical Habitat Designation

144. In order to arrive at an estimate of total costs of future project modifications likely to be required as a result of critical habitat designation for the quino checkerspot, this analysis assumes:

- Habitat mitigation costs will be included as part of all new consultations *except for* DoT road expansion activities and residential developments in Unit 3. DoT road expansion activities are not anticipated to include mitigation, as evidenced from a similar

consultation on this activity.¹¹³ In addition, mitigation costs in Unit 3 are *not* included because the San Diego MSCP already requires mitigation for impacts to habitats used by the butterfly.

- Future consultations will all include a biological monitor, pre-construction surveys, signage, night lighting, and these incremental costs are attributable to the inclusion of quino checkerspot in a consultation;
- Captive breeding, reestablishment and habitat restoration programs will only be included in 25 percent of consultations on residential housing projects, and will not be included as part of consultations on DoT road expansions, or as part of consultations with BIA, BLM or USFS;
- Project modifications included in past consultations on State Route 125, the Otay Mesa gas-fired power plant and international fuel break are sufficient to fulfill requirements of reinitiation, and thus no further project modifications will be included as part of these consultations.

145. Using the above assumptions, this analysis estimates the total costs of project modifications by multiplying the cost of each project modification by the number of times it is likely to be included as part of formal consultations. Exhibit 4-6 presents the estimated costs of project modifications by Action agency. Using this method, this analysis estimates that the total cost of project modifications for incremental consultations for the quino checkerspot may range from \$3.2 million to \$13.3 million. These estimated costs will be borne by the following:

- U.S. Department of Transportation projects will bear approximately \$0.6 to \$1.4 million in incremental project modification costs;
- The U.S. Forest Service will bear approximately \$0.4 to \$0.7 million in incremental project modification costs;
- The Cahuilla Band of Mission Indians may bear between \$0.7 and \$1.5 million in incremental project modification costs; although they may choose not to bear these costs;
- The Federal Communication Commission and associated private

¹¹³ Formal Section 7 consultation on the Realignment and Widening of Laguna Canyon Road, State Route 133, Orange County, California, May 4, 2000.

parties in consultation will bear \$0.7 to \$1.5 million in project modification costs;

- The Environmental Protection Agency and Bureau of Land Management and associated parties in consultation will bear minimal incremental project modification costs;
- Private parties will bear between \$0.8 million and \$8.2 million in incremental project modification costs associated with consultations on residential and light commercial developments.

146. While most of the above project modification costs may be considered incremental to quino checkerspot critical habitat designation, some elements may in fact be included in a consultation because several species are involved in a consultation. This analysis also assumes that all future incremental consultations will be formal. In fact, many incremental consultations may be informal, and thus may result in significantly fewer project modifications. Thus, by assuming that these costs will all be attributable to the designation of critical habitat for the quino checkerspot, this analysis present upper end estimates of likely actual costs that will be borne by parties involved in consultation. The actual costs of project modifications will also depend on future economic activity within the areas of critical habitat, as well as the decisions of private, state, local, and Federal landowners. Therefore, the estimates presented here represent reasonable approximations and should not be interpreted as firm predictions.

147. Exhibit 4-6 summarizes the potential costs of project modifications that may result from the designation of critical habitat for the quino checkerspot.

Exhibit 4-6

**SUMMARY OF POTENTIAL PROJECT MODIFICATION COSTS OF
PROPOSED CRITICAL HABITAT FOR THE QUINO CHECKERSPOT BUTTERFLY
(TEN YEARS)**

Action agency	Reasonably Foreseeable Activities and Land Uses within Proposed Critical Habitat	Estimated Number of Potential New or Reinitiated Consultations	Project Modifications*	Expected Costs of Project Modifications
Bureau of Land Management	Conservation/Land Management activities	1	none	none to negligible
	International fuel break maintenance	1 reinitiation	none	
U.S. Department of Transportation/ CalTrans	Highway construction	2: 1 new, 1 reinitiation	M, P, S, N, C, CB	align="center">\$0.6 million to \$1.4 million
	Road expansions	3	P, S, N, C	
	Railroad restoration	1	M, P, S, N, C, CB	
U.S. Forest Service	Fire station operations and fire station improvements plan	2	M, P, S, N, C	\$0.4 million to \$0.7 million
Cahuilla Band of Mission Indians	Commercial and residential developments	2	M, P, S, N, C	align="center"> <i>\$0.7 million to \$1.5 million</i> (the Tribe may choose not to bear these)
	Sand and gravel mining	1	M, P, S, N, C	
	Bioremediation facility expansion	1	M, P, S, N, C	
Federal Communication Commission	Installation of telecommunications towers and fiber optic lines	4	M, P, S, N, C	\$0.7 million to \$1.5 million

Exhibit 4-6

**SUMMARY OF POTENTIAL PROJECT MODIFICATION COSTS OF
PROPOSED CRITICAL HABITAT FOR THE QUINO CHECKERSPOT BUTTERFLY
(TEN YEARS)**

Action agency	Reasonably Foreseeable Activities and Land Uses within Proposed Critical Habitat	Estimated Number of Potential New or Reinitiated Consultations	Project Modifications*	Expected Costs of Project Modifications
Environmental Protection Agency	Construction of natural gas fired power plant	1 reinitiation	none	none to negligible
Army Corps of Engineers	Management of species on Metropolitan Water District reserves	1	none	\$0.8 million to \$8.2 million
	Residential development	4 to 23	M (except Unit 3), P, S, N, C, CB (25 percent of actions)	
Total				\$3.2 million to \$13.3 million

* Project modifications:

M= Mitigation lands and banking

P= Pre-construction surveys

S= Signage

N= No night lighting

C= Construction time limits

CB= Captive breeding, reestablishment and habitat restoration program

4.4 Potential Impacts on Small Businesses

148. Under the Regulatory Flexibility Act, as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA) of 1996, when a Federal agency publishes a notice of rulemaking for any proposed or final rule, it must prepare and make available for public comment a regulatory flexibility analysis that describes the effect of the rule on small entities (i.e., small businesses, small organizations, and small government jurisdictions).¹¹⁴ However, no regulatory flexibility analysis is required if the head of an agency certifies that the rule will not have a significant economic impact on a substantial number of small entities. SBREFA amended the Regulatory Flexibility Act to require Federal agencies to provide a statement of the factual basis for certifying that a rule will not have a significant economic impact on a substantial number of small entities.
149. Small entities addressed under the Regulatory Flexibility Act/SBREFA and identified as potentially impacted by the quino checkerspot designation include local governments and small businesses. This analysis projects that, over the next ten years, municipal governments and businesses are estimated to seek technical assistance from the Service in 180 instances, or approximately 18 times per year. In addition, private businesses are estimated to complete 10 biological surveys in the same time period, approximately one per year. One new formal consultation is estimated for municipal entities, and consultations that involve private businesses are estimated to range from 13 to 32 over the next ten years, or up to three per year.¹¹⁵ These estimates suggest a minimal impact on small entities for the following reasons: 1) because these estimates of section 7 impacts include entities of all sizes, the overall number of consults, calls, and surveys probably overstates the impact on small entities; and 2) the analysis conservatively assumes that all of the consultations will result in project modifications, which is unlikely. As a result, the number small entities affected by the proposed designation is likely to be smaller than indicated above. The economic impacts associated with the section 7 consultation process, including calls, biological surveys, consultation, and project modification costs, are presented above in Section 4.2 and 4.3.
150. In the past, landowners, builders, and construction employees and their representatives have asserted that critical habitat designations may result in lost employment and lost tax revenue.¹¹⁶ This analysis estimates that several additional consultations in the future may result from the designation of critical habitat, some of which are likely to involve

¹¹⁴ 5 U.S.C. 601 et seq.

¹¹⁵ These consultations include those with ACOE, FCC, and BIA, which are likely to involve third parties.

¹¹⁶ Comments provided by the Building Industry Association of Southern California/BILD Foundation, March 20, 2001 on the *Draft Economic Analysis for the Riverside Fairy Shrimp*.

private contractors. However, past consultations on the quino checkerspot have resulted in recommendations that mitigation lands are purchased in exchange for destruction of quino checkerspot habitat, rather than that limitations on a project's scope. Rather than reducing labor needs, additional labor and materials may be required to fulfill requirements of a consultation with the Service, such as those listed above. Therefore, the net effect of the critical habitat designation on future employment is unclear.

151. As with employment, the net effect of critical habitat on tax revenues is not clearly positive or negative. For example, as mentioned above, the section 7 process could result in a reasonable and prudent alternative that requires portions or an entire large development to be moved from low value land to high value land. This requirement may make it not economical for the development to proceed and thus reduce the tax base of the city. However, the development may proceed on the high value land and increase the municipal tax base beyond what it was prior to the critical habitat designation. Therefore, the net effect of the critical habitat designation on tax revenues will depend on the specific implementation of future significant project modifications.

4.5 Potential Impacts Associated with Property Values

152. Private landowners often express concern that critical habitat designation may lead to reductions in property values as a result of negative public perceptions about the effects of critical habitat designation. For example, developers express concerns that the designation of critical habitat for the peninsular bighorn sheep might result in a zoning change, which could reduce property values.¹¹⁷ Also, people may perceive that critical habitat designation on private land will require a landowner to engage in additional mitigation activities beyond what would have occurred under the listing. It is anticipated that any effects on property values resulting from public uncertainty about the impacts of critical habitat designation will dissipate over time as the public acquires information indicating that the actual effects of critical habitat designation on occupied private land are minimal.

¹¹⁷ Personal communication with San Luis Obispo County Realtor, J.H. Edwards Co, October 3, 2000.

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153. To determine the incremental benefits of the critical habitat designation, this report considers those categories of benefit that will be enhanced as a result of the proposed critical habitat designation. These benefits represent incremental benefits of the designation of critical habitat, above and beyond those provided by the listing.
154. The primary goal of listing a species as endangered is to preserve the species from extinction. However, various economic benefits, measured in terms of regional economic performance and enhanced national social welfare, result from species preservation as well. Regional economic benefits can be expressed in terms of jobs created, regional sector revenues, and overall economic activity. For example, the presence of a species may result in a successful local eco-tourism operation. National social welfare values reflect both use and non-use (i.e., existence) values, and can reflect various categories of value. For example, use values might include the opportunity to see a quino checkerspot while on a hike, or the recreational use of habitat area preserved as a result of the quino checkerspot. Existence values are not derived from direct use of the species, but instead reflect the satisfaction and utility people derive from the knowledge that a species exists.
155. The following examples represent potential benefits derived from the listing of the quino checkerspot and, potentially, critical habitat:
- **Ecosystem health.** Quino checkerspots are pollinators, an integral part of most land ecosystems. Absent the quino checkerspot, other natural organisms may suffer. Actions to protect the quino checkerspots may also benefit other organisms. Each one of these organisms may provide some level of direct or indirect benefit to people.
 - **Real estate value effects.** Real estate values may be enhanced by critical habitat designation. For example, such enhancement may occur if open space is preserved or if allowable densities are reduced or kept at current levels as a result of critical habitat designation.

- **Flood control.** Preserving natural environments can also reduce FEMA and county expenditure on bank stabilization and other flood control programs.

156. The benefits identified above arise primarily from the protection afforded to the quino checkerspot under the Federal listing. Critical habitat designation may provide some incremental benefits beyond the listing benefits. Critical habitat designation provides some educational benefit by increasing awareness of the extent of quino checkerspot habitat. Incremental surveys, consultations, and project modifications conducted as a result of the designation of critical habitat are likely to increase the probability that the quino will recover. Critical habitat also provides a legal definition of the extent of quino checkerspot habitat. This reduces the amount of uncertainty Federal agencies face when determining if a section 7 consultation is necessary for an activity with a Federal nexus.

157. The quantification of total economic benefits attributable to the designation of critical habitat is, at best, difficult. Without knowing the exact nature of future consultations and associated project modifications, it is difficult to predict the incremental increase in the probability that the quino checkerspot will recover as a result of critical habitat designation. A single project modification associated with the designation of critical habitat has the potential to save the quino checkerspot. While such a scenario is unlikely, such a hypothetical project modification would bear the entire economic value of the listing of the quino checkerspot as mentioned above. Alternatively, additional consultations attributable to the designation of critical habitat may not in any way increase the probability of recovery for the species. In this case, the incremental benefits of designating critical habitat for the quino checkerspot would be limited to the educational benefits, increased support for existing conservation efforts, and reduced uncertainty regarding the extent of quino checkerspot habitat. In all likelihood, the actual benefits of the designation of critical habitat for the quino checkerspot will lie in between the benefits presented in these extreme examples.

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